

# SEQUENCE LISTING

<110> MUTABILIS

<120> COMPRISING OF POLYPEPTIDES SPECIFIC TO PATHOGENIC STRAINS AND THEIR USE AS VACCINES AND IN IMMUNOTHERAPY

<130> 1721-126

<140> 10/594 461

<141> March 29, 2005

<160> 160

<170> PatentIn version 3.1

<210> 1

<211> 163

<212> PRT

<213> Escherichia coli

<400> 1

Met Lys Leu Lys Ala Ile Ile Leu Ala Thr Gly Leu Ile Asn Cys Ile  
1 5 10 15

Val Phe Ser Ala Gln Ala Val Asp Thr Thr Ile Thr Val Thr Gly Asn  
20 25 30

Val Leu Gln Arg Thr Cys Asn Val Pro Gly Asn Val Asp Val Ser Leu  
35 40 45

Gly Asn Leu Tyr Val Ser Asp Phe Pro Asn Ala Gly Ser Gly Ser Pro  
50 55 60

Trp Val Asn Phe Asp Leu Ser Leu Thr Gly Cys Gln Asn Met Asn Thr  
65 70 75 80

Val Arg Ala Thr Phe Ser Gly Thr Ala Asp Gly Gln Thr Tyr Tyr Ala  
85 90 95

Asn Thr Gly Asn Ala Gly Gly Ile Lys Ile Glu Ile Gln Asp Arg Asp  
100 105 110

Gly Ser Asn Ala Ser Tyr His Asn Gly Met Phe Lys Thr Leu Asn Val  
115 120 125

Gln Asn Asn Asn Ala Thr Phe Asn Leu Lys Ala Arg Ala Val Ser Lys  
130 135 140

Gly Gln Val Thr Pro Gly Asn Ile Ser Ser Val Ile Thr Val Thr Tyr  
 145 150 155 160

Thr Tyr Ala

<210> 2  
 <211> 673  
 <212> PRT  
 <213> Escherichia coli

<400> 2

Met Lys Met Thr Arg Leu Tyr Pro Leu Ala Leu Gly Gly Leu Leu Leu  
 1 5 10 15

Pro Ala Ile Ala Asn Ala Gln Thr Ser Gln Gln Asp Glu Ser Thr Leu  
 20 25 30

Val Val Thr Ala Ser Lys Gln Ser Ser Arg Ser Ala Ser Ala Asn Asn  
 35 40 45

Val Ser Ser Thr Val Val Ser Ala Pro Glu Leu Ser Asp Ala Gly Val  
 50 55 60

Thr Ala Ser Asp Lys Leu Pro Arg Val Leu Pro Gly Leu Asn Ile Glu  
 65 70 75 80

Asn Ser Gly Asn Met Leu Phe Ser Thr Ile Ser Leu Arg Gly Val Ser  
 85 90 95

Ser Ala Gln Asp Phe Tyr Asn Pro Ala Val Thr Leu Tyr Val Asp Gly  
 100 105 110

Val Pro Gln Leu Ser Thr Asn Thr Ile Gln Ala Leu Thr Asp Val Gln  
 115 120 125

Ser Val Glu Leu Leu Arg Gly Pro Gln Gly Thr Leu Tyr Gly Lys Ser  
 130 135 140

Ala Gln Gly Gly Ile Ile Asn Ile Val Thr Gln Gln Pro Asp Ser Thr  
 145 150 155 160

Pro Arg Gly Tyr Ile Glu Gly Gly Val Ser Ser Arg Asp Ser Tyr Arg  
165 170 175

Ser Lys Phe Asn Leu Ser Gly Pro Ile Gln Asp Gly Leu Leu Tyr Gly  
180 185 190

Ser Val Thr Leu Leu Arg Gln Val Asp Asp Gly Asp Met Ile Asn Pro  
195 200 205

Ala Thr Gly Ser Asp Asp Leu Gly Gly Thr Arg Ala Ser Ile Gly Asn  
210 215 220

Val Lys Leu Arg Leu Ala Pro Asp Asp Gln Pro Trp Glu Met Gly Phe  
225 230 235 240

Ala Ala Ser Arg Glu Cys Thr Arg Ala Thr Gln Asp Ala Tyr Val Gly  
245 250 255

Trp Asn Asp Ile Lys Gly Arg Lys Leu Ser Ile Ser Asp Gly Ser Pro  
260 265 270

Asp Pro Tyr Met Arg Arg Cys Thr Asp Ser Gln Thr Leu Ser Gly Lys  
275 280 285

Tyr Thr Thr Asp Asp Trp Val Phe Asn Leu Ile Ser Ala Trp Gln Gln  
290 295 300

Gln His Tyr Ser Arg Thr Phe Pro Ser Gly Ser Leu Ile Val Asn Met  
305 310 315 320

Ser Gln Arg Trp Asn Gln Asp Val Gln Glu Leu Arg Ala Ala Thr Leu  
325 330 335

Gly Asp Ala Arg Thr Val Asp Met Val Phe Gly Leu Tyr Arg Gln Asn  
340 345 350

Thr Arg Glu Lys Leu Asn Ser Ala Tyr Asp Met Pro Thr Met Pro Tyr  
355 360 365

Leu Ser Ser Thr Gly Tyr Thr Thr Ala Glu Thr Leu Ala Ala Tyr Ser  
370 375 380

Asp Leu Thr Trp His Leu Thr Asp Arg Phe Asp Ile Gly Gly Gly Val

385		390		395		400
Arg Phe Ser His Asp	Lys Ser Ser Thr	Gln Tyr His Gly	Ser Met Leu			
	405		410		415	
Gly Asn Pro Phe Gly	Asp Gln Gly Lys	Ser Asn Asp Asp	Gln Val Leu			
	420		425		430	
Gly Gln Leu Ser Ala	Gly Tyr Met Leu	Thr Asp Asp Trp	Arg Val Tyr			
	435		440		445	
Thr Arg Val Ala Gln	Gly Tyr Lys Pro	Ser Gly Tyr Asn	Ile Val Pro			
	450		455		460	
Thr Ala Gly Leu Asp	Ala Lys Pro Phe	Val Ala Glu Lys	Ser Ile Asn			
	465		470		475	480
Tyr Glu Leu Gly Thr	Arg Tyr Glu Thr	Ala Asp Val Thr	Leu Gln Ala			
	485		490		495	
Ala Thr Phe Tyr Thr	His Thr Lys Asp	Met Gln Leu Tyr	Ser Gly Pro			
	500		505		510	
Val Gly Met Gln Thr	Leu Ser Asn Ala	Gly Lys Ala Asp	Ala Thr Gly			
	515		520		525	
Val Glu Leu Glu Ala	Lys Trp Arg Phe	Ala Pro Gly Trp	Ser Trp Asp			
	530		535		540	
Ile Asn Gly Asn Val	Ile Arg Ser Glu	Phe Thr Asn Asp	Ser Glu Leu			
	545		550		555	560
Tyr His Gly Asn Arg	Val Pro Phe Val	Pro Arg Tyr Gly	Ala Gly Ser			
	565		570		575	
Ser Val Asn Gly Val	Ile Asp Thr Arg	Tyr Gly Ala Leu	Met Pro Arg			
	580		585		590	
Leu Ala Val Asn Leu	Val Gly Pro His	Tyr Phe Asp Gly	Asp Asn Gln			
	595		600		605	
Leu Arg Gln Gly Thr	Tyr Ala Thr Leu	Asp Ser Ser Leu	Gly Trp Gln			
	610		615		620	

Ala Thr Glu Arg Met Asn Ile Ser Val Tyr Val Asp Asn Leu Phe Asp  
625 630 635 640

Arg Arg Tyr Arg Thr Tyr Gly Tyr Met Asn Gly Ser Ser Ala Val Ala  
645 650 655

Gln Val Asn Met Gly Arg Thr Val Gly Ile Asn Thr Arg Ile Asp Phe  
660 665 670

Phe

<210> 3  
<211> 246  
<212> PRT  
<213> Escherichia coli

<400> 3

Met Asn Lys Val Phe Val Val Ser Val Val Ala Ala Ala Cys Val Phe  
1 5 10 15

Ala Val Asn Ala Gly Ala Lys Glu Gly Lys Ser Gly Phe Tyr Leu Thr  
20 25 30

Gly Lys Ala Gly Ala Ser Val Met Ser Leu Ser Asp Gln Arg Phe Leu  
35 40 45

Ser Gly Asp Glu Glu Glu Thr Ser Lys Tyr Lys Gly Gly Asp Asp His  
50 55 60

Asp Thr Val Phe Ser Gly Gly Ile Ala Val Gly Tyr Asp Phe Tyr Pro  
65 70 75 80

Gln Phe Ser Ile Pro Val Arg Thr Glu Leu Glu Phe Tyr Ala Arg Gly  
85 90 95

Lys Ala Asp Ser Lys Tyr Asn Val Asp Lys Asp Ser Trp Ser Gly Gly  
100 105 110

Tyr Trp Arg Asp Asp Leu Lys Asn Glu Val Ser Val Asn Thr Leu Met  
115 120 125

Leu Asn Ala Tyr Tyr Asp Phe Arg Asn Asp Ser Ala Phe Thr Pro Trp  
130 135 140

Val Ser Ala Gly Ile Gly Tyr Ala Arg Ile His Gln Lys Thr Thr Gly  
145 150 155 160

Ile Ser Thr Trp Asp Tyr Glu Tyr Gly Ser Ser Gly Arg Glu Ser Leu  
165 170 175

Ser Arg Ser Gly Ser Ala Asp Asn Phe Ala Trp Ser Leu Gly Ala Gly  
180 185 190

Val Arg Tyr Asp Val Thr Pro Asp Ile Ala Leu Asp Leu Ser Tyr Arg  
195 200 205

Tyr Leu Asp Ala Gly Asp Ser Ser Val Ser Tyr Lys Asp Glu Trp Gly  
210 215 220

Asp Lys Tyr Lys Ser Glu Val Asp Val Lys Ser His Asp Ile Met Leu  
225 230 235 240

Gly Met Thr Tyr Asn Phe  
245

<210> 4

<211> 166

<212> PRT

<213> Escherichia coli

<400> 4

Met Lys Leu Lys Ala Ile Ile Leu Ala Thr Gly Leu Ile Asn Cys Ile  
1 5 10 15

Ala Phe Ser Ala Gln Ala Val Asp Thr Thr Ile Thr Val Thr Gly Arg  
20 25 30

Val Leu Pro Arg Thr Cys Thr Ile Gly Asn Gly Gly Asn Pro Asn Ala  
35 40 45

Thr Val Val Leu Asp Asn Ala Tyr Thr Ser Asp Leu Ile Ala Ala Asn  
50 55 60

Ser Thr Ser Gln Trp Lys Asn Phe Ser Leu Thr Leu Thr Asn Cys Gln  
65 70 75 80

Asn Val Asn Asn Val Thr Ser Phe Gly Gly Thr Ala Glu Asn Thr Asn  
85 90 95

Tyr Tyr Arg Asn Thr Gly Asp Ala Thr Asn Ile Met Val Glu Leu Gln  
100 105 110

Glu Gln Gly Asn Gly Asn Thr Pro Leu Lys Val Gly Ser Thr Lys Val  
115 120 125

Val Thr Val Ser Asn Gly Gln Ala Thr Phe Asn Leu Lys Val Arg Ala  
130 135 140

Val Ser Lys Gly Asn Ala Gly Ala Gly Ser Ile Asn Ser Gln Ile Thr  
145 150 155 160

Val Thr Tyr Thr Tyr Ala  
165

<210> 5

<211> 1295

<212> PRT

<213> Escherichia coli

<400> 5

Met Asn Lys Ile Tyr Ser Leu Lys Tyr Ser Ala Ala Thr Gly Gly Leu  
1 5 10 15

Ile Ala Val Ser Glu Leu Ala Lys Arg Val Ser Gly Lys Thr Asn Arg  
20 25 30

Lys Leu Val Ala Thr Met Leu Ser Leu Ala Val Ala Gly Thr Val Asn  
35 40 45

Ala Ala Asn Ile Asp Ile Ser Asn Val Trp Ala Arg Asp Tyr Leu Asp  
50 55 60

Leu Ala Gln Asn Lys Gly Ile Phe Gln Pro Gly Ala Thr Asp Val Thr  
65 70 75 80

Ile Thr Leu Lys Asn Gly Asp Lys Phe Ser Phe His Asn Leu Ser Ile  
85 90 95

Pro Asp Phe Ser Gly Ala Ala Ala Ser Gly Ala Ala Thr Ala Ile Gly  
100 105 110

Gly Ser Tyr Ser Val Thr Val Ala His Asn Lys Lys Asn Pro Gln Ala  
115 120 125

Ala Glu Thr Gln Val Tyr Ala Gln Ser Ser Tyr Arg Val Val Asp Arg  
130 135 140

Arg Asn Ser Asn Asp Phe Glu Ile Gln Arg Leu Asn Lys Phe Val Val  
145 150 155 160

Glu Thr Val Gly Ala Thr Pro Ala Glu Thr Asn Pro Thr Thr Tyr Ser  
165 170 175

Asp Ala Leu Glu Arg Tyr Gly Ile Val Thr Ser Asp Gly Ser Lys Lys  
180 185 190

Ile Ile Gly Phe Arg Ala Gly Ser Gly Gly Thr Ser Phe Ile Asn Gly  
195 200 205

Glu Ser Lys Ile Ser Thr Asn Ser Ala Tyr Ser His Asp Leu Leu Ser  
210 215 220

Ala Ser Leu Phe Glu Val Thr Gln Trp Asp Ser Tyr Gly Met Met Ile  
225 230 235 240

Tyr Lys Asn Asp Lys Thr Phe Arg Asn Leu Glu Ile Phe Gly Asp Ser  
245 250 255

Gly Ser Gly Ala Tyr Leu Tyr Asp Asn Lys Leu Glu Lys Trp Val Leu  
260 265 270

Val Gly Thr Thr His Gly Ile Ala Ser Val Asn Gly Asp Gln Leu Thr  
275 280 285

Trp Ile Thr Lys Tyr Asn Asp Lys Leu Val Ser Glu Leu Lys Asp Thr  
290 295 300

Tyr Ser His Lys Ile Asn Leu Asn Gly Asn Asn Val Thr Ile Lys Asn  
305 310 315 320

Thr Asp Ile Thr Leu His Gln Asn Asn Ala Asp Thr Thr Gly Thr Gln  
325 330 335

Glu Lys Ile Thr Lys Asp Lys Asp Ile Val Phe Thr Asn Gly Gly Asp



340

345

350

Val Leu Phe Lys Asp Asn Leu Asp Phe Gly Ser Gly Gly Ile Ile Phe  
 355 360 365

Asp Glu Gly His Glu Tyr Asn Ile Asn Gly Gln Gly Phe Thr Phe Lys  
 370 375 380

Gly Ala Gly Ile Asp Ile Gly Lys Glu Ser Ile Val Asn Trp Asn Ala  
 385 390 395 400

Leu Tyr Ser Ser Asp Asp Val Leu His Lys Ile Gly Pro Gly Thr Leu  
 405 410 415

Asn Val Gln Lys Lys Gln Gly Ala Asn Ile Lys Ile Gly Glu Gly Asn  
 420 425 430

Val Ile Leu Asn Glu Glu Gly Thr Phe Asn Asn Ile Tyr Leu Ala Ser  
 435 440 445

Gly Asn Gly Lys Val Ile Leu Asn Lys Asp Asn Ser Leu Gly Asn Asp  
 450 455 460

Gln Tyr Ala Gly Ile Phe Phe Thr Lys Arg Gly Gly Thr Leu Asp Leu  
 465 470 475 480

Asn Gly His Asn Gln Thr Phe Thr Arg Ile Ala Ala Thr Asp Asp Gly  
 485 490 495

Thr Thr Ile Thr Asn Ser Asp Thr Thr Lys Glu Ala Val Leu Ala Ile  
 500 505 510

Asn Asn Glu Asp Ser Tyr Ile Tyr His Gly Asn Ile Asn Gly Asn Ile  
 515 520 525

Lys Leu Thr His Asn Ile Asn Ser Gln Asp Lys Lys Thr Asn Ala Lys  
 530 535 540

Leu Ile Leu Asp Gly Ser Val Asn Thr Lys Asn Asp Val Glu Val Ser  
 545 550 555 560

Asn Ala Ser Leu Thr Met Gln Gly His Ala Thr Glu His Ala Ile Phe  
 565 570 575

Arg Ser Ser Ala Asn His Cys Ser Leu Val Phe Leu Cys Gly Thr Asp  
580 585 590

Trp Val Thr Val Leu Lys Glu Thr Glu Ser Ser Tyr Asn Lys Lys Phe  
595 600 605

Asn Ser Asp Tyr Lys Ser Asn Asn Gln Gln Thr Ser Phe Asp Gln Pro  
610 615 620

Asp Trp Lys Thr Gly Val Phe Lys Phe Asp Thr Leu His Leu Asn Asn  
625 630 635 640

Ala Asp Phe Ser Ile Ser Arg Asn Ala Asn Val Glu Gly Asn Ile Ser  
645 650 655

Ala Asn Lys Ser Ala Ile Thr Ile Gly Asp Lys Asn Val Tyr Ile Asp  
660 665 670

Asn Leu Ala Gly Lys Asn Ile Thr Asn Asn Gly Phe Asp Phe Lys Gln  
675 680 685

Thr Ile Ser Thr Asn Leu Ser Ile Gly Glu Thr Lys Phe Thr Gly Gly  
690 695 700

Ile Thr Ala His Asn Ser Gln Ile Ala Ile Gly Asp Gln Ala Val Val  
705 710 715 720

Thr Leu Asn Gly Ala Thr Phe Leu Asp Asn Thr Pro Ile Ser Ile Asp  
725 730 735

Lys Gly Ala Lys Val Ile Ala Gln Asn Ser Met Phe Thr Thr Lys Gly  
740 745 750

Ile Asp Ile Ser Gly Glu Leu Thr Met Met Gly Ile Pro Glu Gln Asn  
755 760 765

Ser Lys Thr Val Thr Pro Gly Leu His Tyr Ala Ala Asp Gly Phe Arg  
770 775 780

Leu Ser Gly Gly Asn Ala Asn Phe Ile Ala Arg Asn Met Ala Ser Val  
785 790 795 800

Thr Gly Asn Ile Tyr Ala Asp Asp Ala Ala Thr Ile Thr Leu Gly Gln  
 805 810 815

Pro Glu Thr Glu Thr Pro Thr Ile Ser Ser Ala Tyr Gln Ala Trp Ala  
 820 825 830

Glu Thr Leu Leu Tyr Gly Phe Asp Thr Ala Tyr Arg Gly Ala Ile Thr  
 835 840 845

Ala Pro Lys Ala Thr Val Ser Met Asn Asn Ala Ile Trp His Leu Asn  
 850 855 860

Ser Gln Ser Ser Ile Asn Arg Leu Glu Thr Lys Asp Ser Met Val Arg  
 865 870 875 880

Phe Thr Gly Asp Asn Gly Lys Phe Thr Thr Leu Thr Val Asn Asn Leu  
 885 890 895

Thr Ile Asp Asp Ser Ala Phe Val Leu Arg Ala Asn Leu Ala Gln Ala  
 900 905 910

Asp Gln Leu Val Val Asn Lys Ser Leu Ser Gly Lys Asn Asn Leu Leu  
 915 920 925

Leu Val Asp Phe Ile Glu Lys Asn Gly Asn Ser Asn Gly Leu Asn Ile  
 930 935 940

Asp Leu Val Ser Ala Pro Lys Gly Thr Ala Val Asp Val Phe Lys Ala  
 945 950 955 960

Thr Thr Arg Ser Ile Gly Phe Ser Asp Val Thr Pro Val Ile Glu Gln  
 965 970 975

Lys Asn Asp Thr Asp Lys Ala Thr Trp Thr Leu Ile Gly Tyr Lys Ser  
 980 985 990

Val Ala Asn Ala Asp Ala Ala Lys Lys Ala Thr Leu Leu Met Ser Gly  
 995 1000 1005

Gly Tyr Lys Ala Phe Leu Ala Glu Val Asn Asn Leu Asn Lys Arg  
 1010 1015 1020

Met Gly Asp Leu Arg Asp Ile Asn Gly Glu Ser Gly Ala Trp Ala  
1025 1030 1035

Arg Ile Ile Ser Gly Thr Gly Ser Ala Gly Gly Gly Phe Ser Asp  
1040 1045 1050

Asn Tyr Thr His Val Gln Val Gly Ala Asp Asn Lys His Glu Leu  
1055 1060 1065

Asp Gly Leu Asp Leu Phe Thr Gly Val Thr Met Thr Tyr Thr Asp  
1070 1075 1080

Ser His Ala Gly Ser Asp Ala Phe Ser Gly Glu Thr Lys Ser Val  
1085 1090 1095

Gly Ala Gly Leu Tyr Ala Ser Ala Met Phe Glu Ser Gly Ala Tyr  
1100 1105 1110

Ile Asp Leu Ile Gly Lys Tyr Val His His Asp Asn Glu Tyr Thr  
1115 1120 1125

Ala Thr Phe Ala Gly Leu Gly Thr Arg Asp Tyr Ser Ser His Ser  
1130 1135 1140

Trp Tyr Ala Gly Ala Glu Val Gly Tyr Arg Tyr His Val Thr Asp  
1145 1150 1155

Ser Ala Trp Ile Glu Pro Gln Ala Glu Leu Val Tyr Gly Ala Val  
1160 1165 1170

Ser Gly Lys Gln Phe Ser Trp Lys Asp Gln Gly Met Asn Leu Thr  
1175 1180 1185

Met Lys Asp Lys Asp Phe Asn Pro Leu Ile Gly Arg Thr Gly Val  
1190 1195 1200

Asp Val Gly Lys Ser Phe Ser Gly Lys Asp Trp Lys Val Thr Ala  
1205 1210 1215

Arg Ala Gly Leu Gly Tyr Gln Phe Asp Leu Phe Ala Asn Gly Glu  
1220 1225 1230

Thr Val Leu Arg Asp Ala Ser Gly Glu Lys Arg Ile Lys Gly Glu  
1235 1240 1245

Lys Asp Gly Arg Met Leu Met Asn Val Gly Leu Asn Ala Glu Ile  
1250 1255 1260

Arg Asp Asn Leu Arg Phe Gly Leu Glu Phe Glu Lys Ser Ala Phe  
1265 1270 1275

Gly Lys Tyr Asn Val Asp Asn Ala Ile Asn Ala Asn Phe Arg Tyr  
1280 1285 1290

Ser Phe  
1295

<210> 6  
<211> 142  
<212> PRT  
<213> Escherichia coli

<400> 6

Met Ile Asn Ile Pro Ser Pro Thr Ala Val Val Met Ala Leu Val Ala  
1 5 10 15

Ile Ser Thr Leu Pro Ser Pro Ser Arg Val Lys Leu Met Pro Tyr Pro  
20 25 30

Pro Arg Ala His Asn Thr Thr Gly Leu Leu Pro Val Arg Glu Ile Cys  
35 40 45

Phe Pro His His Gly Asp Asp Gly Arg Asn Ser Ile Glu Pro Ser Ile  
50 55 60

Ser Arg Ala Ala His Thr Asp Arg Leu Arg Phe Val Cys Met Thr Arg  
65 70 75 80

Thr Gly Ser Thr Thr Ser Arg Pro Phe Cys Pro Ile Pro Arg Ser Pro  
85 90 95

Ala Leu Asn Ala Ser Gly Gln Gln Asp Ser Gly Phe Trp Gly Val Ser  
100 105 110

Ser Ile Pro Gly Asp Ile Leu Met Phe Gln Leu His Val Leu Ile Val  
115 120 125

Phe Ile Cys Lys Ile Asn Leu Ser Asp Asn Asn Ile Ser Tyr  
130 135 140

<210> 7  
<211> 318  
<212> PRT  
<213> Escherichia coli

<400> 7

Met Tyr Ala Arg Glu Tyr Arg Ser Thr Arg Pro His Lys Ala Ile Phe  
1 5 10 15

Phe His Leu Ser Cys Leu Thr Leu Ile Cys Ser Ala Gln Val Tyr Ala  
20 25 30

Lys Pro Asp Met Arg Pro Leu Gly Pro Asn Ile Ala Asp Lys Gly Ser  
35 40 45

Val Phe Tyr His Phe Ser Ala Thr Ser Phe Asp Ser Val Asp Gly Thr  
50 55 60

Arg His Tyr Arg Val Trp Thr Ala Val Pro Asn Thr Thr Ala Pro Ala  
65 70 75 80

Ser Gly Tyr Pro Ile Leu Tyr Met Leu Asp Gly Asn Ala Val Met Asp  
85 90 95

Arg Leu Asp Asp Glu Leu Leu Lys Gln Leu Ser Glu Lys Thr Pro Pro  
100 105 110

Val Ile Val Ala Val Gly Tyr Gln Thr Asn Leu Pro Phe Asp Leu Asn  
115 120 125

Ser Arg Ala Tyr Asp Tyr Thr Pro Ala Ala Glu Ser Arg Lys Thr Asp  
130 135 140

Leu His Ser Gly Arg Phe Ser Arg Lys Ser Gly Gly Ser Asn Asn Phe  
145 150 155 160

Arg Gln Leu Leu Glu Thr Arg Ile Ala Pro Lys Val Glu Gln Gly Leu  
165 170 175

Asn Ile Asp Arg Gln Arg Arg Gly Leu Trp Gly His Ser Tyr Gly Gly  
180 185 190

Leu Phe Val Leu Asp Ser Trp Leu Ser Ser Ser Tyr Phe Arg Ser Tyr  
195 200 205

Tyr Ser Ala Ser Pro Ser Leu Gly Arg Gly Tyr Asp Ala Leu Leu Ser  
210 215 220

Arg Val Thr Ala Val Glu Pro Leu Gln Phe Cys Thr Lys His Leu Ala  
225 230 235 240

Ile Met Glu Gly Ser Ala Thr Gln Gly Asp Asn Arg Glu Thr His Ala  
245 250 255

Val Gly Val Leu Ser Lys Ile His Thr Thr Leu Thr Ile Leu Lys Asp  
260 265 270

Lys Gly Val Asn Ala Val Phe Trp Asp Phe Pro Asn Leu Gly His Gly  
275 280 285

Pro Met Phe Asn Ala Ser Phe Arg Gln Ala Leu Leu Asp Ile Ser Gly  
290 295 300

Glu Asn Ala Asn Tyr Thr Ala Gly Cys His Glu Leu Ser His  
305 310 315

<210> 8  
<211> 725  
<212> PRT  
<213> Escherichia coli

<400> 8

Met Arg Ile Asn Lys Ile Leu Trp Ser Leu Thr Val Leu Leu Val Gly  
1 5 10 15

Leu Asn Ser Gln Val Ser Val Ala Lys Tyr Ser Asp Asp Asp Asn Asp  
20 25 30

Glu Thr Leu Val Val Glu Ala Thr Ala Glu Gln Val Leu Lys Gln Gln  
35 40 45

Pro Gly Val Ser Val Ile Thr Ser Glu Asp Ile Lys Lys Thr Pro Pro  
50 55 60

Val Asn Asp Leu Ser Asp Ile Ile Arg Lys Met Pro Gly Val Asn Leu  
65 70 75 80

Thr Gly Asn Ser Ala Ser Gly Thr Arg Gly Asn Asn Arg Gln Ile Asp  
85 90 95

Ile Arg Gly Met Gly Pro Glu Asn Thr Leu Ile Leu Ile Asp Gly Val  
100 105 110

Pro Val Thr Ser Arg Asn Ser Val Arg Tyr Ser Trp Arg Gly Glu Arg

115

120

125

Asp Thr Arg Gly Asp Thr Asn Trp Val Pro Pro Glu Gln Val Glu Arg  
130 135 140

Ile Glu Val Ile Arg Gly Pro Ala Ala Ala Arg Tyr Gly Ser Gly Ala  
145 150 155 160

Ala Gly Gly Val Val Asn Ile Ile Thr Lys Arg Pro Thr Asn Asp Trp  
165 170 175

His Gly Ser Leu Ser Leu Tyr Thr Asn Gln Pro Glu Ser Ser Glu Glu  
180 185 190

Gly Ala Thr Arg Arg Ala Asn Phe Ser Leu Ser Gly Pro Leu Ala Gly  
195 200 205

Asp Ala Leu Thr Thr Arg Leu Tyr Gly Asn Leu Asn Lys Thr Asp Ala  
210 215 220

Asp Ser Trp Asp Ile Asn Ser Pro Val Gly Thr Lys Asn Ala Ala Gly  
225 230 235 240

His Glu Gly Val Arg Asn Lys Asp Ile Asn Gly Val Val Ser Trp Lys  
245 250 255

Leu Asn Pro Gln Gln Ile Leu Asp Phe Glu Val Gly Tyr Ser Arg Gln  
260 265 270



Gly Asn Ile Tyr Ala Gly Asp Thr Gln Asn Ser Ser Ser Ser Ala Val  
275 280 285

Thr Glu Ser Leu Ala Lys Ser Gly Lys Glu Thr Asn Arg Leu Tyr Arg  
290 295 300

Gln Asn Tyr Gly Ile Thr His Asn Gly Ile Trp Asp Trp Gly Gln Ser  
305 310 315 320

Arg Phe Gly Val Tyr Tyr Glu Lys Thr Asn Asn Thr Arg Met Asn Glu  
325 330 335

Gly Leu Ser Gly Gly Gly Glu Gly Arg Ile Leu Ala Gly Glu Lys Phe  
340 345 350

Thr Thr Asn Arg Leu Ser Ser Trp Arg Thr Ser Gly Glu Leu Asn Ile  
355 360 365

Pro Leu Asn Val Met Val Asp Gln Thr Leu Thr Val Gly Ala Glu Trp  
370 375 380

Asn Arg Asp Lys Leu Asp Asp Pro Ser Ser Thr Ser Leu Thr Val Asn  
385 390 395 400

Asp Arg Asp Ile Ser Gly Ile Ser Gly Ser Ala Ala Asp Arg Ser Ser  
405 410 415

Lys Asn His Ser Gln Ile Ser Ala Leu Tyr Ile Glu Asp Asn Ile Glu  
420 425 430

Pro Val Pro Gly Thr Asn Ile Ile Pro Gly Leu Arg Phe Asp Tyr Leu  
435 440 445

Ser Asp Ser Gly Gly Asn Phe Ser Pro Ser Leu Asn Leu Ser Gln Glu  
450 455 460

Leu Gly Asp Tyr Phe Lys Val Lys Ala Gly Val Ala Arg Thr Phe Lys  
465 470 475 480

Ala Pro Asn Leu Tyr Gln Ser Ser Glu Gly Tyr Leu Leu Tyr Ser Lys  
485 490 495

Gly Asn Gly Cys Pro Lys Asp Ile Thr Ser Gly Gly Cys Tyr Leu Ile  
500 505 510

Gly Asn Lys Asp Leu Asp Pro Glu Ile Ser Val Asn Lys Glu Ile Gly  
515 520 525

Leu Glu Phe Thr Trp Glu Asp Tyr His Ala Ser Val Thr Tyr Phe Arg  
530 535 540

Asn Asp Tyr Gln Asn Lys Ile Val Ala Gly Asp Asn Val Ile Gly Gln  
545 550 555 560

Thr Ala Ser Gly Ala Tyr Ile Leu Lys Trp Gln Asn Gly Gly Lys Ala  
565 570 575

Leu Val Asp Gly Ile Glu Ala Ser Met Ser Phe Pro Leu Val Lys Glu  
580 585 590

Arg Leu Asn Trp Asn Thr Asn Ala Thr Trp Met Ile Thr Ser Glu Gln  
595 600 605

Lys Asp Thr Gly Asn Pro Leu Ser Val Ile Pro Lys Tyr Thr Ile Asn  
610 615 620

Asn Ser Leu Asn Trp Thr Ile Thr Gln Ala Phe Ser Ala Ser Phe Asn  
625 630 635 640

Trp Thr Leu Tyr Gly Arg Gln Lys Pro Arg Thr His Ala Glu Thr Arg  
645 650 655

Ser Glu Asp Thr Gly Gly Leu Ser Gly Lys Glu Leu Gly Ala Tyr Ser  
660 665 670

Leu Val Gly Thr Asn Phe Asn Tyr Asp Ile Asn Lys Asn Leu Arg Leu  
675 680 685

Asn Val Gly Val Ser Asn Ile Leu Asn Lys Gln Ile Phe Arg Ser Ser  
690 695 700

Glu Gly Ala Asn Thr Tyr Asn Glu Pro Gly Arg Ala Tyr Tyr Ala Gly  
705 710 715 720

Val Thr Ala Ser Phe  
725

<210> 9  
<211> 1014  
<212> PRT  
<213> Escherichia coli

<400> 9

Met Gly Asn Gln Trp Gln Gln Lys Tyr Leu Leu Glu Tyr Asn Glu Leu  
1 5 10 15

Val Ser Asn Phe Pro Ser Pro Glu Arg Val Val Ser Asp Tyr Ile Lys  
20 25 30

Asn Cys Phe Lys Thr Asp Leu Pro Trp Phe Ser Arg Ile Asp Pro Asp  
35 40 45

Asn Ala Tyr Phe Ile Cys Phe Ser Gln Asn Arg Ser Asn Ser Arg Ser  
50 55 60

Tyr Thr Gly Trp Asp His Leu Gly Lys Tyr Lys Thr Glu Val Leu Thr  
65 70 75 80

Leu Thr Gln Ala Ala Leu Ile Asn Ile Gly Tyr Arg Phe Asp Val Phe  
85 90 95

Asp Asp Ala Asn Ser Ser Thr Gly Ile Tyr Lys Thr Lys Ser Ala Asp  
100 105 110

Val Phe Asn Glu Glu Asn Glu Glu Lys Met Leu Pro Ser Glu Tyr Leu  
115 120 125

His Phe Leu Gln Lys Cys Asp Phe Ala Gly Val Tyr Gly Lys Thr Leu  
130 135 140

Ser Asp Tyr Trp Ser Lys Tyr Tyr Asp Lys Phe Lys Leu Leu Leu Lys  
145 150 155 160

Asn Tyr Tyr Ile Ser Ser Ala Leu Tyr Leu Tyr Lys Asn Gly Glu Leu  
165 170 175

Asp Glu Arg Glu Tyr Asn Phe Ser Met Asn Ala Leu Asn Arg Ser Asp  
180 185 190

Asn Ile Ser Leu Leu Phe Phe Asp Ile Tyr Gly Tyr Tyr Ala Ser Asp  
195 200 205

Ile Phe Val Ala Lys Asn Asn Asp Lys Val Met Leu Phe Ile Pro Gly  
210 215 220

Ala Lys Lys Pro Phe Leu Phe Lys Lys Asn Ile Ala Asp Leu Arg Leu  
225 230 235 240

Thr Leu Lys Glu Leu Ile Lys Asp Ser Asp Asn Lys Gln Leu Leu Ser  
245 250 255

Gln His Phe Ser Leu Tyr Ser Arg Gln Asp Gly Val Ser Tyr Ala Gly  
260 265 270

Val Asn Ser Val Leu His Ala Ile Glu Asn Asp Gly Asn Phe Asn Glu  
275 280 285

Ser Tyr Phe Leu Tyr Ser Asn Lys Thr Leu Ser Asn Lys Asp Val Phe  
290 295 300

Asp Ala Ile Ala Ile Ser Val Lys Lys Arg Ser Phe Ser Asp Gly Asp  
305 310 315 320

Ile Val Ile Lys Ser Asn Ser Glu Ala Gln Arg Asp Tyr Ala Leu Thr  
325 330 335

Ile Leu Gln Thr Ile Leu Ser Met Thr Pro Ile Phe Asp Ile Val Val  
340 345 350

Pro Glu Val Ser Val Pro Leu Gly Leu Gly Ile Ile Thr Ser Ser Met  
355 360 365

Gly Ile Ser Phe Asp Gln Leu Ile Asn Gly Asp Thr Tyr Glu Glu Arg  
370 375 380

Arg Ser Ala Ile Pro Gly Leu Ala Thr Asn Ala Val Leu Leu Gly Leu  
385 390 395 400

Ser Phe Ala Ile Pro Leu Leu Ile Ser Lys Ala Gly Ile Asn Gln Glu  
405 410 415

Val Leu Ser Ser Val Ile Asn Asn Glu Gly Arg Thr Leu Asn Glu Thr  
420 425 430

Asn Ile Asp Ile Phe Leu Lys Glu Tyr Gly Ile Ala Glu Asp Ser Ile  
435 440 445

Ser Ser Thr Asn Leu Leu Asp Val Lys Leu Lys Ser Ser Gly Gln His  
450 455 460

Val Asn Ile Val Lys Leu Ser Asp Glu Asp Asn Gln Ile Val Ala Val  
465 470 475 480

Lys Gly Ser Ser Leu Ser Gly Ile Tyr Tyr Glu Val Asp Ile Glu Thr  
485 490 495

Gly Tyr Glu Ile Leu Ser Arg Arg Ile Tyr Arg Thr Glu Tyr Asn Asn  
500 505 510

Glu Ile Leu Trp Thr Arg Gly Gly Gly Leu Lys Gly Gly Gln Pro Phe  
515 520 525

Asp Phe Glu Ser Leu Asn Ile Pro Val Phe Phe Lys Asp Glu Pro Tyr  
530 535 540

Ser Ala Val Thr Gly Ser Pro Leu Ser Phe Ile Asn Asp Asp Ser Ser  
545 550 555 560

Leu Leu Tyr Pro Asp Thr Asn Pro Lys Leu Pro Gln Pro Thr Ser Glu  
565 570 575

Met Asp Ile Val Asn Tyr Val Lys Gly Ser Gly Ser Phe Gly Asp Arg  
580 585 590

Phe Val Thr Leu Met Arg Gly Ala Thr Glu Glu Glu Ala Trp Asn Ile  
595 600 605

Ala Ser Tyr His Thr Ala Gly Gly Ser Thr Glu Glu Leu His Glu Ile  
610 615 620

Leu Leu Gly Gln Gly Pro Gln Ser Ser Leu Gly Phe Thr Glu Tyr Thr  
625 630 635 640

Ser Asn Val Asn Ser Ala Asp Ala Ala Ser Arg Arg His Phe Leu Val

645

650

655

Val Ile Lys Val His Val Lys Tyr Ile Thr Asn Asn Asn Val Ser Tyr  
 660 665 670

Val Asn His Trp Ala Ile Pro Asp Glu Ala Pro Val Glu Val Leu Ala  
 675 680 685

Val Val Asp Arg Arg Phe Asn Phe Pro Glu Pro Ser Thr Pro Pro Asp  
 690 695 700

Ile Ser Thr Ile Arg Lys Leu Leu Ser Leu Arg Tyr Phe Lys Glu Ser  
 705 710 715 720

Ile Glu Ser Thr Ser Lys Ser Asn Phe Gln Lys Leu Ser Arg Gly Asn  
 725 730 735

Ile Asp Val Leu Lys Gly Arg Gly Ser Ile Ser Ser Thr Arg Gln Arg  
 740 745 750

Ala Ile Tyr Pro Tyr Phe Glu Ala Ala Asn Ala Asp Glu Gln Gln Pro  
 755 760 765

Leu Phe Phe Tyr Ile Lys Lys Asp Arg Phe Asp Asn His Gly Tyr Asp  
 770 775 780

Gln Tyr Phe Tyr Asp Asn Thr Val Gly Leu Asn Gly Ile Pro Thr Leu  
 785 790 795 800

Asn Thr Tyr Thr Gly Glu Ile Pro Ser Asp Ser Ser Ser Leu Gly Ser  
 805 810 815

Thr Tyr Trp Lys Lys Tyr Asn Leu Thr Asn Glu Thr Ser Ile Ile Arg  
 820 825 830

Val Ser Asn Ser Ala Arg Gly Ala Asn Gly Ile Lys Ile Ala Leu Glu  
 835 840 845

Glu Val Gln Glu Gly Lys Pro Val Ile Ile Thr Ser Gly Asn Leu Ser  
 850 855 860

Gly Cys Thr Thr Ile Val Ala Arg Lys Glu Gly Tyr Ile Tyr Lys Val  
 865 870 875 880

His Thr Gly Thr Thr Lys Ser Leu Ala Gly Phe Thr Ser Thr Thr Gly  
885 890 895

Val Lys Lys Ala Val Glu Val Leu Glu Leu Leu Thr Lys Glu Pro Ile  
900 905 910

Pro Arg Val Glu Gly Ile Met Ser Asn Asp Phe Leu Val Asp Tyr Leu  
915 920 925

Ser Glu Asn Phe Glu Asp Ser Leu Ile Thr Tyr Ser Ser Ser Glu Lys  
930 935 940

Lys Pro Asp Ser Gln Ile Thr Ile Ile Arg Asp Asn Val Ser Val Phe  
945 950 955 960

Pro Tyr Phe Leu Asp Asn Ile Pro Glu His Gly Phe Gly Thr Ser Ala  
965 970 975

Thr Val Leu Val Arg Val Asp Gly Asn Val Val Val Arg Ser Leu Ser  
980 985 990

Glu Ser Tyr Ser Leu Asn Ala Asp Ala Ser Glu Ile Ser Val Leu Lys  
995 1000 1005

Val Phe Ser Lys Lys Phe  
1010

<210> 10  
<211> 454  
<212> PRT  
<213> Escherichia coli

<400> 10

Met Val Asp Met Ile Asn Glu Ser Ala Arg Gln Thr Pro Val Ile Ala  
1 5 10 15

Gln Thr Asp Val Leu Val Ile Gly Gly Gly Pro Ala Gly Leu Ser Ala  
20 25 30

Ala Ile Ala Ala Gly Arg Leu Gly Ala Arg Thr Met Ile Val Glu Arg  
35 40 45

Tyr Gly Ser Leu Gly Gly Val Leu Thr Gln Val Gly Val Glu Ser Phe  
50 55 60

Ala Trp Tyr Arg His Pro Gly Thr Glu Asp Cys Glu Gly Ile Cys Arg  
65 70 75 80

Glu Tyr Glu Gly Arg Ala Arg Ala Leu Gly Phe Thr Arg Pro Glu Pro  
85 90 95

Gln Ser Ile Ser Glu Val Ile Asp Thr Glu Gly Phe Lys Val Val Ala  
100 105 110

Asp Gln Met Ile Thr Glu Ser Gly Val Glu Pro Leu Tyr His Ser Trp  
115 120 125

Val Val Asp Val Ile Lys Asp Gly Asp Thr Leu Cys Gly Val Ile Val  
130 135 140

Glu Asn Lys Ser Gly Arg Gly Ala Ile Leu Ala Lys Arg Ile Val Asp  
145 150 155 160

Cys Thr Gly Asp Ala Asp Ile Ala Ala Arg Ala Gly Ala Pro Trp Thr  
165 170 175

Lys Arg Ser Lys Asp Gln Leu Met Gly Val Thr Val Met Phe Ser Cys  
180 185 190

Ala Gly Val Asp Val Ala Arg Phe Asn Arg Phe Val Ala Glu Glu Leu  
195 200 205

Lys Pro Thr Tyr Ala Asp Trp Gly Lys Asn Trp Thr Ile Gln Thr Thr  
210 215 220

Gly Lys Glu Asp Pro Met Phe Ser Pro Tyr Met Glu Asp Ile Phe Thr  
225 230 235 240

Arg Ala Gln Gln Asp Gly Val Ile Pro Gly Asp Ala Gln Ala Ile Ala  
245 250 255

Gly Thr Trp Ser Thr Phe Ser Glu Ser Gly Glu Ala Phe Gln Met Asn  
260 265 270

Met Val Tyr Ala Phe Gly Phe Asp Cys Thr Asp Val Phe Asp Leu Thr



275	280	285
Lys Ala Glu Ile Ala	Gly Arg Gln Gln Ala	Leu Trp Ala Ile Asp Ala
290	295	300
Leu Arg His Tyr Val	Pro Gly Phe Glu Asn Val	Arg Leu Arg Asn Phe
305	310	315
Gly Ala Thr Leu Gly	Thr Arg Glu Ser Arg	Leu Ile Glu Gly Glu Ile
325	330	335
Arg Ile Ala Asp Asp	Tyr Val Leu Asn Gln	Gly Arg Cys Ser Asp Ser
340	345	350
Val Gly Ile Phe Pro	Glu Phe Ile Asp Gly	Ser Gly Tyr Leu Ile Leu
355	360	365
Pro Thr Thr Gly Arg	Phe Phe Gln Ile Pro	Tyr Gly Cys Leu Val Pro
370	375	380
Gln Lys Val Glu Asn	Leu Leu Val Ala Gly	Arg Cys Ile Ser Ala Gly
385	390	395
Val Val Ala His Thr	Ser Met Arg Asn Met	Met Cys Cys Ala Val Thr
405	410	415
Gly Glu Ala Ala Gly	Thr Ala Ala Val Val	Ser Leu Gln Gln Asn Cys
420	425	430
Thr Val Arg Gln Val	Ala Ile Pro Asp Leu	Gln Asn Thr Leu Gln Gln
435	440	445
Gln Gly Val Arg Leu	Ala	
450		
<210> 11		
<211> 253		
<212> PRT		
<213> Escherichia coli		
<400> 11		
Met Ser Ala Lys Arg	Arg Leu Leu Ile Ala	Cys Thr Leu Ile Thr Ala
1	5	10
		15

Ile Tyr His Phe Pro Ala Tyr Ser Ser Leu Glu Tyr Lys Gly Thr Phe  
20 25 30

Gly Ser Ile Asn Ala Gly Tyr Ala Asp Trp Asn Ser Gly Phe Val Asn  
35 40 45

Thr His Arg Gly Glu Val Trp Lys Val Thr Ala Asp Phe Gly Val Asn  
50 55 60

Phe Lys Glu Ala Glu Phe Tyr Ser Phe Tyr Glu Ser Asn Val Leu Asn  
65 70 75 80

His Ala Val Ala Gly Arg Asn His Thr Val Ser Ala Met Thr His Val  
85 90 95

Arg Leu Phe Asp Ser Asp Met Thr Phe Phe Gly Lys Ile Tyr Gly Gln  
100 105 110

Trp Asp Asn Ser Trp Gly Asp Asp Leu Asp Met Phe Tyr Gly Phe Gly  
115 120 125

Tyr Leu Gly Trp Asn Gly Glu Trp Gly Phe Phe Lys Pro Tyr Ile Gly  
130 135 140

Leu His Asn Gln Ser Gly Asp Tyr Val Ser Ala Lys Tyr Gly Gln Thr  
145 150 155 160

Asn Gly Trp Asn Gly Tyr Val Val Gly Trp Thr Ala Val Leu Pro Phe  
165 170 175

Thr Leu Phe Asp Glu Lys Phe Val Leu Ser Asn Trp Asn Glu Ile Glu  
180 185 190

Leu Asp Arg Asn Asp Ala Tyr Thr Glu Gln Gln Phe Gly Arg Asn Gly  
195 200 205

Leu Asn Gly Gly Leu Thr Ile Ala Trp Lys Phe Tyr Pro Arg Trp Lys  
210 215 220

Ala Ser Val Thr Trp Arg Tyr Phe Asp Asn Lys Leu Gly Tyr Asp Gly  
225 230 235 240

Phe Gly Asp Gln Met Ile Tyr Met Leu Gly Tyr Asp Phe  
245 250

<210> 12  
<211> 492  
<212> PRT  
<213> Escherichia coli

<400> 12

Met Ala Ser Leu Ile Gly Leu Ala Val Cys Thr Gly Asn Ala Phe Ser  
1 5 10 15

Pro Ala Leu Ala Ala Glu Ala Lys Gln Pro Asn Leu Val Ile Ile Met  
20 25 30

Ala Asp Asp Leu Gly Tyr Gly Asp Leu Ala Thr Tyr Gly His Gln Ile  
35 40 45

Val Lys Thr Pro Asn Ile Asp Arg Leu Ala Gln Glu Gly Val Lys Phe  
50 55 60

Thr Asp Tyr Tyr Ala Pro Ala Pro Leu Ser Ser Pro Ser Arg Ala Gly  
65 70 75 80

Leu Leu Thr Gly Arg Met Pro Phe Arg Thr Gly Ile Arg Ser Trp Ile  
85 90 95

Pro Ser Gly Lys Asp Val Ala Leu Gly Arg Asn Glu Leu Thr Ile Ala  
100 105 110

Asn Leu Leu Lys Ala Gln Gly Tyr Asp Thr Ala Met Met Gly Lys Leu  
115 120 125

His Leu Asn Ala Gly Gly Asp Arg Thr Asp Gln Pro Gln Ala Gln Asp  
130 135 140

Met Gly Phe Asp Tyr Ser Leu Ala Asn Thr Ala Gly Phe Val Thr Asp  
145 150 155 160

Ala Thr Leu Asp Asn Ala Lys Glu Arg Pro Arg Tyr Gly Met Val Tyr  
165 170 175

Pro Thr Gly Trp Leu Arg Asn Gly Gln Pro Thr Pro Arg Ala Asp Lys  
180 185 190

Met Ser Gly Glu Tyr Val Ser Ser Glu Val Val Asn Trp Leu Asp Asn  
195 200 205

Lys Lys Asp Ser Lys Pro Phe Phe Leu Tyr Val Ala Phe Thr Glu Val  
210 215 220

His Ser Pro Leu Ala Ser Pro Lys Lys Tyr Leu Asp Met Tyr Ser Gln  
225 230 235 240

Tyr Met Ser Ala Tyr Gln Lys Gln His Pro Asp Leu Phe Tyr Gly Asp  
245 250 255

Trp Ala Asp Lys Pro Trp Arg Gly Val Gly Glu Tyr Tyr Ala Asn Ile  
260 265 270

Ser Tyr Leu Asp Ala Gln Val Gly Lys Val Leu Asp Lys Ile Lys Ala  
275 280 285

Met Gly Glu Glu Asp Asn Thr Ile Val Ile Phe Thr Ser Asp Asn Gly  
290 295 300

Pro Val Thr Arg Glu Ala Arg Lys Val Tyr Glu Leu Asn Leu Ala Gly  
305 310 315 320

Glu Thr Asp Gly Leu Arg Gly Arg Lys Asp Asn Leu Trp Glu Gly Gly  
325 330 335

Ile Arg Val Pro Ala Ile Ile Lys Tyr Gly Lys His Leu Pro Gln Gly  
340 345 350

Met Val Ser Asp Thr Pro Val Tyr Gly Leu Asp Trp Met Pro Thr Leu  
355 360 365

Ala Lys Met Met Asn Phe Lys Leu Pro Thr Asp Arg Thr Phe Asp Gly  
370 375 380

Glu Ser Leu Val Pro Val Leu Glu Gln Lys Ala Leu Lys Arg Glu Lys  
385 390 395 400

Pro Leu Ile Phe Gly Ile Asp Met Pro Phe Gln Asp Asp Pro Thr Asp  
405 410 415

Glu Trp Ala Ile Arg Asp Gly Asp Trp Lys Met Ile Ile Asp Arg Asn  
420 425 430

Asn Lys Pro Lys Tyr Leu Tyr Asn Leu Lys Ser Asp Arg Tyr Glu Thr  
435 440 445

Leu Asn Leu Ile Gly Lys Lys Pro Asp Ile Glu Lys Gln Met Tyr Gly  
450 455 460

Lys Phe Leu Lys Tyr Lys Thr Asp Ile Asp Asn Asp Ser Leu Met Lys  
465 470 475 480

Ala Arg Gly Asp Lys Pro Glu Ala Val Thr Trp Gly  
485 490

<210> 13  
<211> 345  
<212> PRT  
<213> Escherichia coli

<400> 13

Leu Ile Ser Leu Ser Phe Ile Pro Val Met Ser Ala Leu Pro Gly Pro  
1 5 10 15

Ile Ala Lys Gly Phe Arg Asn Glu Arg Gly Phe Val Thr Thr Thr Ile  
20 25 30

Cys Ala Met Gly Glu Leu Leu Ala Glu Phe Leu Ser Arg Asn Pro His  
35 40 45

Gln Lys Phe Thr Gln Pro Gly Glu Phe Ile Gly Pro Phe Pro Ser Gly  
50 55 60

Ala Pro Ala Ile Phe Ala Ala Gln Val Ala Lys Leu Ser His Arg Ala  
65 70 75 80

Ile Phe Phe Gly Cys Val Gly Asn Asp Asp Phe Ala Arg Leu Ile Ile  
85 90 95

Glu Arg Leu Arg His Glu Gly Val Ile Thr Asp Gly Ile His Val Met  
100 105 110

Asn Asn Ala Val Thr Gly Thr Ala Phe Val Ser Tyr Gln Asn Pro Gln  
115 120 125

Gln Arg Asp Phe Val Phe Asn Ile Pro Asn Ser Ala Cys Gly Leu Phe  
130 135 140

Thr Ala Glu His Ile Asp Lys Asp Leu Leu Lys Gln Cys Asn His Leu  
145 150 155 160

His Ile Val Gly Ser Ser Leu Phe Ser Phe Arg Met Ile Asp Val Met  
165 170 175

Arg Lys Ala Ile Thr Thr Ile Lys Ser Ala Gly Gly Thr Val Ser Phe  
180 185 190

Asp Pro Asn Ile Arg Lys Glu Met Leu Ser Ile Pro Glu Met Ala Gln  
195 200 205

Ala Leu Asp Tyr Leu Ile Glu Tyr Thr Asp Ile Phe Ile Pro Ser Glu  
210 215 220

Ser Glu Leu Pro Phe Phe Ala Arg His Lys Asn Leu Ser Glu Glu Gln  
225 230 235 240

Ile Val Ser Asp Leu Leu His Gly Gly Val Lys His Val Ala Ile Lys  
245 250 255

Arg Ala Gln Arg Gly Ala Ser Tyr Tyr Lys Leu Lys Asn Gly Thr Leu  
260 265 270

His Ala Gln His Val Ala Gly His Asp Ile Glu Ile Ile Asp Pro Thr  
275 280 285

Gly Ala Gly Asp Cys Phe Gly Ala Thr Phe Ile Thr Leu Phe Leu Ser  
290 295 300

Gly Phe Pro Ala His Lys Ala Leu Gln Tyr Ala Asn Ala Ser Gly Ala  
305 310 315 320

Leu Ala Val Met Arg Gln Gly Pro Met Glu Gly Ile Ser Ser Leu Ala  
325 330 335

Asp Ile Glu Asp Phe Leu Gln Gln His

340

345

<210> 14  
 <211> 192  
 <212> PRT  
 <213> Escherichia coli

<400> 14

Met Tyr Met Pro Gly Lys Gln Met Leu Cys Cys Ile Leu Ile Ser Ile  
 1 5 10 15

Ile Ser Glu Gly Asp Met Lys Ile Phe Ile Ser Leu Phe Leu Phe Ile  
 20 25 30

Ile Ser Thr Asn Ser Phe Ala Asp Asp Ile Thr His Ala Gly Val Val  
 35 40 45

Arg Ile Glu Gly Leu Ile Thr Glu Lys Thr Cys Ile Ile Ser Asp Glu  
 50 55 60

Ser Lys Asn Phe Thr Val Asn Met Pro Asp Val Pro Ser Ser Ser Val  
 65 70 75 80

Arg Ser Ala Gly Asp Val Thr Glu Lys Val Tyr Phe Ser Ile Thr Leu  
 85 90 95

Thr Arg Cys Gly Ser Asp Val Gly Asn Ala Tyr Ile Lys Phe Thr Gly  
 100 105 110

Asn Thr Val Ser Glu Asp Ala Ser Leu Tyr Lys Leu Glu Asp Gly Ser  
 115 120 125

Val Glu Gly Leu Ala Leu Thr Ile Phe Asp Lys Asn Lys Gly Ser Ile  
 130 135 140

Ser Asn Asp Val Lys Ser Met Val Phe Ser Leu Thr Ser Ser Val Asp  
 145 150 155 160

Asn Ile Leu His Phe Phe Ala Ala Tyr Lys Ala Leu Lys Asn Asn Val  
 165 170 175

Gln Pro Gly Asp Ala Asn Ala Ser Val Ser Phe Ile Val Thr Tyr Asp  
 180 185 190

<210> 15  
<211> 201  
<212> PRT  
<213> Escherichia coli

<400> 15

Met Ile Lys Phe Arg Leu Tyr Ile Pro Pro Val Ile Leu Gly Phe Val  
1 5 10 15

Ile Val Pro Leu Leu Val Trp Pro Thr Val Ile Ala Leu Ala Val Leu  
20 25 30

Ile Phe Thr Leu Thr Phe Leu Ala Glu Ile Ile Phe Ser Phe Pro Leu  
35 40 45

Leu Val Val Arg Ile Ser Leu Gln Glu Leu Gln Leu Glu Leu Leu Val  
50 55 60

Val Tyr Ala Leu Phe Phe Ser Val Met Gly Gly Ile Gly Trp Gln Phe  
65 70 75 80

Ser Arg Arg Thr Pro Pro Glu Leu Lys Asn Arg Leu His Cys Trp Leu  
85 90 95

Val Phe Ser Pro Val Tyr Phe Trp Leu Ile Leu Ser Asn Phe Ile Leu  
100 105 110

Tyr Ile Ser Pro Glu Lys Ser Ala Leu Leu Glu Asn Ile Arg Asn Phe  
115 120 125

Phe Leu Thr Phe Val Trp Leu Pro Leu Asn Phe Ser Pro Phe Trp Pro  
130 135 140

Gln Pro Trp Thr Asp Phe Val Gly Pro Ile Ser Ala Gln Leu Gly Phe  
145 150 155 160

Ala Leu Gly Tyr Tyr Cys Gln Trp Arg Ser Lys Asn Arg Ser His Arg  
165 170 175

Lys Lys Trp Gly Asp Trp Val Thr Cys Leu Ser Leu Ala Ile Leu Ala  
180 185 190

Leu Gly Pro Leu Phe Asn Tyr Leu Gln



<210> 16  
 <211> 234  
 <212> PRT  
 <213> Escherichia coli

<400> 16

Met Lys Phe Asn Leu Ser Asn Leu Ser Ala Val Leu Leu Ala Ser Gly  
 1 5 10 15

Met Leu Met Ser Thr Ala Val Thr Ala Ala Pro Gly Asp Ala Thr Gln  
 20 25 30

Phe Gly Gly Ala Asp Thr Asp Trp Ser Thr Val Asp Tyr Pro Arg Leu  
 35 40 45

Thr Asp Met Asp Asp Asn Val Asp Ser Met Gly Gly Lys Ile Arg Phe  
 50 55 60

Thr Gly Arg Val Val Lys Ala Thr Cys Lys Val Ala Thr Asp Ser Lys  
 65 70 75 80

Gln Ile Glu Val Val Leu Pro Val Val Pro Ser Asn Leu Phe Thr Gly  
 85 90 95

Ile Asp Val Glu Ala Gln Gly Ala Ser Asn Gln Thr Asp Phe Asn Ile  
 100 105 110

Asn Leu Thr Glu Cys Ser Asn Thr Asp Asp Gln Lys Ile Glu Phe Arg  
 115 120 125

Phe Thr Gly Thr Ala Asp Ser Ala Asn Lys Thr Leu Ala Asn Glu Val  
 130 135 140

Glu Gly Ser Thr Asp Ala Asp Asn Ser Gly Asn Ala Gly Ala Thr Gly  
 145 150 155 160

Val Gly Ile Arg Ile Tyr Ser Lys Gly Thr Thr Asn Asn Gly Leu Ile  
 165 170 175

Asn Leu Asn Thr Thr Ala Ala Glu Gly Ser Ala Ser Thr Ala Ala Tyr  
 180 185 190

Thr Ile Pro Gly Asn Ala Thr Thr His Asp Phe Ser Ala Ala Phe Thr  
195 200 205

Ala Gly Tyr Ala Gln Asn Gly Ser Thr Val Ala Pro Gly Val Val Lys  
210 215 220

Ser Thr Ala Ser Phe Val Val Leu Tyr Glu  
225 230

<210> 17  
<211> 336  
<212> PRT  
<213> Escherichia coli

<400> 17

Met Arg Ile His Thr Tyr Trp Tyr Arg Arg Tyr Phe Ile Leu Leu Ile  
1 5 10 15

Ile Ile Phe Ser Asn Val Leu Ser Ser Ile Ala Asn Ala Glu Asp Met  
20 25 30

Gly Arg Glu Arg Ala Tyr Cys Tyr Pro Gly Ser Pro Ser Asn Asn Thr  
35 40 45

Thr Pro Ala Ser Phe Ser Tyr Asn Phe Gly Thr Ile Val Val Ser Asp  
50 55 60

Val Asn Lys Asn Ala Pro Gly Thr Val Leu Pro Ser Gln Ile Trp Lys  
65 70 75 80

Val Gly Thr Tyr Lys Ala Tyr Cys Asn Ser Leu Asp Asp Tyr Glu Ile  
85 90 95

Tyr Phe Ser Ala Val Ser Gly Ile Asp Pro Ser Gly Ala Ser Gly Asp  
100 105 110

His Gln Gly Ser Asp Val Phe Ile Pro Leu Thr His Glu Ile Ser Val  
115 120 125

Ser Thr His Ile Lys Leu Tyr Asn Gln Asn Gly Thr Met Thr Asp Lys  
130 135 140

Ile Val Pro Phe Glu Asn Tyr Asn Thr Asn Tyr Pro Gly Asp Arg Ser

145		150		155		160									
Lys	Pro	Ser	Asn	Trp	Ala	Ser	Gly	Thr	Glu	Gly	Tyr	Ile	Lys	Ile	Arg
			165						170					175	
Ile	Asp	Lys	Lys	Ile	Ile	Ser	Asp	Val	Ser	Leu	Ser	Asn	Val	Leu	Leu
		180						185					190		
Val	Ser	Leu	Tyr	Val	Ser	Gln	Ile	Pro	Thr	Glu	His	Gly	Pro	Ile	Pro
		195					200					205			
Val	Phe	Asn	Ala	Tyr	Ile	Gly	Asn	Leu	Asn	Ile	Gln	Val	Pro	Gln	Gly
	210					215					220				
Cys	Thr	Ile	Asn	Glu	Gly	Thr	Ser	Phe	Thr	Val	Asn	Met	Pro	Asp	Val
225					230					235					240
Trp	Ala	Ser	Glu	Leu	Ser	Arg	Ala	Gly	Ala	Gly	Ala	Lys	Pro	Ala	Gly
			245						250					255	
Val	Thr	Pro	Val	Ala	Thr	Thr	Ile	Pro	Ile	Asn	Cys	Thr	Asn	Lys	Asp
			260					265					270		
Thr	Asp	Ala	Val	Met	Thr	Leu	Val	Phe	Asp	Gly	Asn	Ile	Ser	Ala	Thr
	275						280						285		
Arg	Asp	Thr	Asn	Gly	Lys	Gln	Ser	Ile	Ile	Gln	Ala	Gln	Asp	Asn	Pro
	290					295					300				
Asp	Val	Gly	Ile	Met	Ile	Met	Asp	Ser	Gln	Gln	Asn	Ser	Val	Asp	Leu
305					310					315					320
Asn	Ala	Leu	Ala	Thr	Ser	Val	Gly	Val	Pro	Phe	Arg	Leu	Val	Glu	Asn
			325						330					335	
<210> 18															
<211> 864															
<212> PRT															
<213> Escherichia coli															
<400> 18															
Met	Asn	Leu	Lys	Leu	Lys	Arg	Cys	Glu	Tyr	Trp	Met	Ala	Ala	Gln	Lys
1				5					10					15	

Gln Met Lys Arg Val Val Pro Leu Leu Leu Val Ile Met Pro Ala Cys  
 20 25 30

Ser Ile Ala Gly Met Arg Phe Asn Pro Ala Phe Leu Ser Gly Asp Thr  
 35 40 45

Glu Ala Val Ala Asp Leu Ser Arg Phe Glu Lys Gly Met Thr Tyr Leu  
 50 55 60

Pro Gly Ser Tyr Glu Val Glu Val Trp Val Asn Asp Ser Pro Leu Leu  
 65 70 75 80

Ser Arg Thr Val Thr Phe Lys Ala Asp Asp Glu Asn Gln Leu Ile Pro  
 85 90 95

Cys Leu Ser Leu Ala Asp Leu Leu Ser Leu Gly Ile Asn Lys Asn Ala  
 100 105 110

Leu Pro Glu Gln Ala Leu Ala Ser Ser Glu Asn Ser Cys Leu Asp Leu  
 115 120 125

Arg Ile Trp Phe Pro Asp Val His Tyr Met Pro Glu Leu Asp Ala Gln  
 130 135 140

Arg Leu Lys Leu Thr Phe Pro Gln Ala Ile Ile Lys Arg Asp Ala Arg  
 145 150 155 160

Gly Tyr Ile Pro Pro Glu Gln Trp Asp Asn Gly Ile Thr Ala Phe Leu  
 165 170 175

Leu Asn Tyr Asp Phe Ser Gly Asn Asn Asp Arg Gly Asp Tyr Ser Ser  
 180 185 190

Asn Asn Tyr Tyr Leu Asn Leu Arg Ala Gly Ile Asn Ile Gly Ala Trp  
 195 200 205

Arg Phe Arg Asp Tyr Ser Thr Trp Ser Arg Gly Ser Asn Ser Ala Gly  
 210 215 220

Lys Leu Glu His Ile Ser Ser Thr Leu Gln Arg Val Ile Ile Pro Phe  
 225 230 235 240

Arg Ser Glu Leu Thr Leu Gly Asp Thr Trp Ser Ser Ser Asp Val Phe  
245 250 255

Asp Ser Val Ser Ile Arg Gly Ile Lys Leu Glu Ser Asp Glu Asn Met  
260 265 270

Leu Pro Asp Ser Gln Ser Gly Phe Ala Pro Thr Val Arg Gly Ile Ala  
275 280 285

Lys Ser Arg Ala Gln Val Thr Ile Lys Gln Asn Gly Tyr Val Ile Tyr  
290 295 300

Gln Thr Tyr Met Pro Pro Gly Pro Phe Glu Ile Ser Asp Leu Asn Pro  
305 310 315 320

Thr Ser Ser Ala Gly Asp Leu Glu Val Thr Ile Lys Glu Ser Asp Asn  
325 330 335

Ser Glu Thr Val Tyr Thr Val Pro Tyr Ala Ala Val Pro Ile Leu Gln  
340 345 350

Arg Glu Gly His Leu Lys Tyr Ser Thr Thr Val Gly Gln Tyr Arg Ser  
355 360 365

Asn Ser Tyr Asn Gln Lys Ser Pro Tyr Val Phe Gln Gly Glu Leu Ile  
370 375 380

Trp Gly Leu Pro Trp Asp Ile Thr Ala Tyr Gly Gly Ala Gln Phe Ser  
385 390 395 400

Glu Asp Tyr Arg Ala Leu Ala Leu Gly Leu Gly Leu Asn Leu Gly Val  
405 410 415

Phe Gly Ala Thr Ser Phe Asp Val Thr Gln Ala Asn Ser Ser Leu Val  
420 425 430

Asp Gly Ser Lys His Gln Gly Gln Ser Tyr Arg Phe Leu Tyr Ser Lys  
435 440 445

Ser Leu Val Gln Thr Gly Thr Ala Phe His Ile Ile Gly Tyr Arg Tyr  
450 455 460

Ser Thr Gln Gly Phe Tyr Thr Leu Ser Asp Thr Thr Tyr Gln Gln Met

465		470		475		480
Ser Gly Thr Val Val Asp Pro Lys Thr Leu Asp Asp Lys Asp Tyr Val						
	485			490		495
Tyr Asn Trp Asn Asp Phe Tyr Asn Leu Arg Tyr Ser Lys Arg Gly Lys						
	500		505			510
Phe Gln Ala Ser Val Ser Gln Pro Phe Gly Asn Tyr Gly Ser Met Tyr						
	515		520		525	
Leu Ser Ala Ser Gln Gln Thr Tyr Trp Asn Thr Asp Lys Lys Asp Ser						
	530		535		540	
Leu Tyr Gln Val Gly Tyr Asn Thr Ser Ile Lys Gly Ile Tyr Leu Asn						
545		550		555		560
Val Ala Trp Asn Tyr Ser Lys Ser Pro Gly Thr Asn Ala Asp Lys Ile						
	565		570			575
Val Ser Leu Asn Val Ser Leu Pro Ile Ser Asn Trp Leu Ser Ser Thr						
	580		585			590
Asn Asp Gly Arg Ser Ser Ser Asn Ala Met Thr Ala Thr Tyr Gly Tyr						
	595		600			605
Ser Gln Asp Asn His Gly Gln Val Asn Gln Tyr Thr Gly Val Ser Gly						
	610		615			620
Ser Leu Leu Glu Gln His Asn Leu Ser Tyr Asn Ile Gln His Gly Phe						
625		630		635		640
Ala Asn Gln Asp Asn Ser Ser Ser Gly Ser Val Gly Val Asn Tyr Arg						
	645		650			655
Gly Ala Tyr Gly Ser Leu Asn Ser Ala Tyr Ser Tyr Asp Asn Glu Gly						
	660		665			670
Asn Gln Gln Ile Asn Tyr Gly Ile Ser Gly Ala Leu Val Val His Glu						
	675		680			685
Asn Gly Leu Thr Leu Ser Gln Pro Leu Gly Glu Thr Asn Val Leu Ile						
	690		695		700	

Lys Ala Pro Gly Ala Asn Asn Val Asp Val Gln Arg Gly Thr Gly Ile  
705 710 715 720

Ser Thr Asp Trp Arg Gly Tyr Ala Val Val Pro Tyr Ala Thr Glu Tyr  
725 730 735

Arg Arg Asn Asn Ile Ser Leu Asp Pro Met Ser Met Asn Met His Thr  
740 745 750

Glu Leu Asp Ile Thr Ser Thr Glu Val Ile Pro Gly Lys Gly Ala Leu  
755 760 765

Val Arg Ala Glu Phe Ala Ala His Ile Gly Ile Arg Gly Leu Phe Thr  
770 775 780

Val Arg Tyr Arg Asn Lys Ser Val Pro Phe Gly Ala Thr Ala Ser Ala  
785 790 795 800

Gln Ile Lys Asn Ser Ser Gln Ile Thr Gly Ile Val Gly Asp Asn Gly  
805 810 815

Gln Leu Tyr Leu Ser Gly Leu Pro Leu Glu Gly Val Ile Asn Ile Gln  
820 825 830

Trp Gly Asp Gly Val Gln Gln Lys Cys Gln Ala Asn Tyr Lys Leu Pro  
835 840 845

Glu Thr Glu Leu Asp Asn Pro Val Ser Tyr Ala Thr Leu Glu Cys Arg  
850 855 860

<210> 19  
<211> 169  
<212> PRT  
<213> Escherichia coli

<400> 19

Met Gly Ala Ile Tyr Val Lys Arg Leu Ile Leu Ser Val Ala Leu Ile  
1 5 10 15

Ile Pro Ile Ala Ser Asn Ala Ser Asp Ala Leu Asn Gln Pro Ser Ser  
20 25 30

Ser Leu Asn Asp Gly Val Glu Thr Phe Phe Ile Ser Cys Phe Asp Met  
35 40 45

Pro Gln Glu Thr Thr Thr Asp Met Asp Ala Cys Gln Arg Val Gln Leu  
50 55 60

Ala Gln Val Ser Trp Val Lys Asn Lys Tyr Ser Val Ala Ala Leu Asn  
65 70 75 80

Arg Leu Lys Gln Asp Asn Lys Asp Asp Pro Gln Arg Leu Gln Glu Leu  
85 90 95

Thr Ala Ser Phe Asn Ala Glu Ser Glu Ala Trp Thr Glu Leu Ile Glu  
100 105 110

Lys Ala Ser Lys Ser Val Gln Val Asp Tyr Val Gly Gly Thr Ile Ala  
115 120 125

Gly Thr Ala Val Ala Ser Arg Gln Ile Gly Leu Leu Glu Leu Gln Ser  
130 135 140

His Asp Ile Trp Glu His Trp Leu Arg Ser Arg Gly Leu Asn Ser Ser  
145 150 155 160

Ser Phe Ala Arg Thr Lys Val Gln Ile  
165

<210> 20  
<211> 713  
<212> PRT  
<213> Escherichia coli

<400> 20

Met Ala Met Phe Thr Pro Ser Phe Ser Gly Leu Lys Gly Arg Ala Leu  
1 5 10 15

Phe Ser Leu Leu Phe Ala Ala Pro Met Ile His Ala Thr Asp Ser Val  
20 25 30

Thr Thr Lys Asp Gly Glu Thr Ile Thr Val Thr Ala Asp Ala Asn Thr  
35 40 45



Ala Thr Glu Ala Thr Asp Gly Tyr Gln Pro Leu Ser Thr Ser Thr Ala  
50 55 60

Thr Leu Thr Asp Met Pro Met Leu Asp Ile Pro Gln Val Val Asn Thr  
65 70 75 80

Val Ser Asp Gln Val Leu Glu Asn Gln Asn Ala Thr Thr Leu Asp Glu  
85 90 95

Ala Leu Tyr Asn Val Ser Asn Val Val Gln Thr Asn Thr Leu Gly Gly  
100 105 110

Thr Gln Asp Ala Phe Val Arg Arg Gly Phe Gly Ala Asn Arg Asp Gly  
115 120 125

Ser Ile Met Thr Asn Gly Leu Arg Thr Val Leu Pro Arg Ser Phe Asn  
130 135 140

Ala Ala Thr Glu Arg Val Glu Val Leu Lys Gly Pro Ala Ser Thr Leu  
145 150 155 160

Tyr Gly Ile Leu Asp Pro Gly Gly Leu Ile Asn Val Val Thr Lys Arg  
165 170 175

Pro Glu Lys Thr Phe His Gly Ser Val Ser Ala Thr Ser Ser Ser Phe  
180 185 190

Gly Gly Gly Thr Gly Gln Leu Asp Ile Thr Gly Pro Ile Glu Gly Thr  
195 200 205

Gln Leu Ala Tyr Arg Leu Thr Gly Glu Val Gln Asp Glu Asp Tyr Trp  
210 215 220

Arg Asn Phe Gly Lys Glu Arg Ser Thr Phe Ile Ala Pro Ser Leu Thr  
225 230 235 240

Trp Phe Gly Asp Asn Ala Thr Val Thr Met Leu Tyr Ser His Arg Asp  
245 250 255

Tyr Lys Thr Pro Phe Asp Arg Gly Thr Ile Phe Asp Leu Thr Thr Lys  
260 265 270

Gln Pro Val Asn Val Asp Arg Lys Ile Arg Phe Asp Glu Pro Phe Asn  
275 280 285

Ile Thr Asp Gly Gln Ser Asp Leu Ala Gln Leu Asn Ala Glu Tyr His  
290 295 300

Leu Asn Ser Gln Trp Thr Ala Arg Phe Asp Tyr Ser Tyr Ser Gln Asp  
305 310 315 320

Lys Tyr Ser Asp Asn Gln Ala Arg Val Thr Ala Tyr Asp Ala Thr Thr  
325 330 335

Gly Thr Leu Thr Arg Arg Val Asp Ala Thr Gln Gly Ser Thr Gln Arg  
340 345 350

Met His Ala Thr Arg Ala Asp Leu Gln Gly Asn Val Asp Ile Ala Gly  
355 360 365

Phe Tyr Asn Glu Ile Leu Gly Gly Val Ser Tyr Glu Tyr Tyr Asp Leu  
370 375 380

Leu Arg Thr Asp Met Ile Arg Cys Lys Lys Ala Lys Asp Phe Asn Ile  
385 390 395 400

Tyr Asn Pro Val Tyr Gly Asn Thr Ser Lys Cys Thr Thr Val Ser Ala  
405 410 415

Ser Asp Ser Asp Gln Thr Ile Lys Gln Glu Asn Tyr Ser Ala Tyr Ala  
420 425 430

Gln Asp Ala Leu Tyr Leu Thr Asp Asn Trp Ile Ala Val Ala Gly Ile  
435 440 445

Arg Tyr Gln Tyr Tyr Thr Gln Tyr Ala Gly Lys Gly Arg Pro Phe Asn  
450 455 460

Val Asn Thr Asp Ser Arg Asp Glu Gln Trp Thr Pro Lys Leu Gly Leu  
465 470 475 480

Val Tyr Lys Leu Thr Pro Ser Val Ser Leu Phe Ala Asn Tyr Ser Gln  
485 490 495

Thr Phe Met Pro Gln Ser Ser Ile Ala Ser Tyr Ile Gly Asp Leu Pro

500

505

510

Pro Glu Ser Ser Asn Ala Tyr Glu Val Gly Ala Lys Phe Glu Leu Phe  
 515 520 525

Asp Gly Ile Thr Ala Asp Ile Ala Leu Phe Asp Ile His Lys Arg Asn  
 530 535 540

Val Leu Tyr Thr Glu Ser Ile Gly Asp Glu Thr Ile Ala Lys Thr Ala  
 545 550 555 560

Gly Arg Val Arg Ser Arg Gly Val Glu Val Asp Leu Ala Gly Ala Leu  
 565 570 575

Thr Glu Asn Ile Asn Ile Ile Ala Ser Tyr Gly Tyr Thr Asp Ala Lys  
 580 585 590

Val Leu Glu Asp Pro Asp Tyr Ala Gly Lys Pro Leu Pro Asn Val Pro  
 595 600 605

Arg His Thr Gly Ser Leu Phe Leu Thr Tyr Asp Ile His Asn Met Pro  
 610 615 620

Gly Asn Asn Thr Leu Thr Phe Gly Gly Gly Gly His Gly Val Ser Arg  
 625 630 635 640

Arg Ser Ala Thr Asn Gly Ala Asp Tyr Tyr Leu Pro Gly Tyr Phe Val  
 645 650 655

Ala Asp Ala Phe Ala Ala Tyr Lys Met Lys Leu Gln Tyr Pro Val Thr  
 660 665 670

Leu Gln Leu Asn Val Lys Asn Leu Phe Asp Lys Thr Tyr Thr Ser  
 675 680 685

Ser Ile Ala Thr Asn Asn Leu Gly Asn Gln Ile Gly Asp Pro Arg Glu  
 690 695 700

Val Gln Phe Thr Val Lys Met Glu Phe  
 705 710

<210> 21  
 <211> 606

<212> PRT

<213> Escherichia coli

<400> 21

Met Lys Ile Ser Trp Asn Tyr Ile Phe Lys Asn Lys Trp Arg Phe His  
1 5 10 15

Ile Thr Ser Ile Ser Leu Phe Leu Ile Met Leu Ala Val Ser Ile Ala  
20 25 30

Phe Leu His Leu Arg Phe Asn Thr Leu Ser Ser Thr Asp Lys Met Arg  
35 40 45

Leu Glu Met Tyr Lys Ser Thr Leu Tyr Ser Thr Ile Glu Gln Phe Tyr  
50 55 60

Val Leu Pro Tyr Met Leu Ser Thr Asp His Ile Ile Arg Gln Ala Val  
65 70 75 80

Ile Thr Pro Asp Asp Met Thr Ser Ser Glu Leu Asn Gln Arg Ile Ala  
85 90 95

His Phe Asn Thr Gln Leu Lys Thr Ala Ala Ile Phe Ile Leu Asp Thr  
100 105 110

Gln Gly Lys Ala Ile Ala Ser Ser Asn Trp Gln Asp Pro Gly Ser Tyr  
115 120 125

Val Gly Gln Asn Tyr Ser Tyr Arg Pro Tyr Tyr Lys His Ala Met Ser  
130 135 140

Gly Leu Asn Gly Arg Phe Tyr Gly Ile Gly Ser Thr Thr Asn Thr Pro  
145 150 155 160

Gly Phe Phe Leu Ser Thr Ser Ile Lys Asp Lys Gly Lys Ile Val Gly  
165 170 175

Val Val Val Val Lys Ile Ser Leu Asn Glu Ile Glu Lys Ala Trp Ala  
180 185 190

Glu Gly Pro Glu Asn Ile Ile Val Asn Asp Glu His Gly Ile Ile Phe  
195 200 205

Leu Ser Ser Lys Ser Pro Trp Arg Met Arg Thr Leu Gln Pro Leu Pro  
210 215 220

Val Gln Ala Lys Gln Lys Leu Gln Ser Thr Arg Gln Tyr Ser Leu Asp  
225 230 235 240

Asn Leu Leu Pro Ala Asp Tyr Tyr Pro Cys Tyr Thr Val Ser Asn Phe  
245 250 255

Thr Phe Leu Lys Asp Lys Lys Glu Gln Leu Cys Leu Phe Pro Gln Tyr  
260 265 270

Tyr Thr Gln Gln Ile Ala Ile Pro Glu Phe Asn Trp Lys Met Thr Ile  
275 280 285

Met Val Pro Leu Asp Asn Leu Tyr Trp Ser Trp Ala Ile Ser Leu Val  
290 295 300

Ile Thr Leu Ile Ile Tyr Leu Leu Phe Leu Leu Phe Ile Lys Tyr Trp  
305 310 315 320

Arg Met Arg Ser His Ala Gln Gln Leu Leu Thr Leu Ala Asn Glu Thr  
325 330 335

Leu Glu Lys Gln Val Lys Glu Arg Thr Ser Ala Leu Glu Leu Ile Asn  
340 345 350

Gln Lys Leu Ile Gln Glu Ile Lys Glu Arg Ser Gln Ala Glu Gln Val  
355 360 365

Leu Gln Ile Thr Arg Ser Glu Leu Ala Glu Ser Ser Lys Leu Ala Ala  
370 375 380

Leu Gly Gln Met Ala Thr Glu Ile Ala His Glu Gln Asn Gln Pro Leu  
385 390 395 400

Ala Ala Ile His Ala Leu Thr Asp Asn Ala Arg Thr Met Leu Lys Lys  
405 410 415

Glu Met Tyr Pro Gln Val Glu Gln Asn Leu Lys His Ile Ile Ser Val  
420 425 430

Ile Glu Arg Met Thr Gln Leu Ile Ser Glu Leu Lys Ala Phe Ala Ser  
435 440 445

Arg His Arg Val Pro Lys Gly Ser Ala Asp Val Ile Lys Val Met Tyr  
450 455 460

Ser Ala Val Ala Leu Leu Asn His Ser Met Glu Lys Asn Asn Ile Glu  
465 470 475 480

Arg Arg Ile Lys Ala Pro Ser Met Pro Leu Phe Val Asn Cys Asp Glu  
485 490 495

Leu Gly Leu Glu Gln Ile Phe Ser Asn Leu Ile Ser Asn Ala Leu Asp  
500 505 510

Ser Met Glu Gly Ser Ser Tyr Lys Arg Leu Asp Ile Ala Ile Arg Gln  
515 520 525

Ala Asn Asn Lys Val Ile Ile Thr Ile Lys Asp Ser Gly Gly Gly Phe  
530 535 540

Ala Pro Glu Val Val Asp Arg Ile Phe Glu Pro Phe Phe Thr Thr Lys  
545 550 555 560

Arg Arg Gly Met Gly Leu Gly Leu Ala Ile Val Ser Glu Ile Val Arg  
565 570 575

Asn Ser Asn Gly Ala Leu His Ala Ser Asn His Pro Glu Gly Gly Ala  
580 585 590

Val Met Thr Leu Thr Trp Pro Glu Trp Gly Glu Glu His Glu  
595 600 605

<210> 22  
<211> 101  
<212> PRT  
<213> Escherichia coli

<400> 22

Val Leu Thr Pro Gln His Leu Arg Cys Val Leu Thr Cys Ser Asp Leu  
1 5 10 15

Leu Thr Leu Leu Ser Gly Thr Val Met Ser Gln Met Pro Leu Tyr Phe

20

25

30

Leu Asn Thr Gln Lys Lys Leu Thr Ala His Tyr Glu Trp Leu Gln Ile  
 35 40 45

Asn Leu Thr Asp Thr Tyr Glu Leu Val Lys Arg Leu Met Pro Ile Pro  
 50 55 60

Ser Leu Asp Val Val Val Lys Val Gly Lys Leu Val Leu Pro Glu Lys  
 65 70 75 80

Gly His His Gly Phe Tyr Pro Glu Ala Gly Val Val Tyr Arg Thr Val  
 85 90 95

Ala Pro Glu Asn Pro  
 100

<210> 23  
 <211> 263  
 <212> PRT  
 <213> Escherichia coli

<400> 23

Met Met Lys Asn Thr Gly Tyr Ile Leu Ala Leu Cys Leu Thr Ala Ser  
 1 5 10 15

Gly His Val Leu Ala His Asp Val Trp Ile Thr Gly Lys Gln Ala Glu  
 20 25 30

Asn Asn Val Thr Ala Glu Ile Gly Tyr Gly His Asn Phe Pro Ser Lys  
 35 40 45

Gly Thr Ile Pro Asp Arg Arg Asp Phe Phe Glu Asn Pro Arg Leu Tyr  
 50 55 60

Asn Gly Lys Glu Thr Ile Thr Leu Lys Pro Ala Ser Thr Asp Tyr Val  
 65 70 75 80

Tyr Lys Thr Glu Ser Ala Ser Lys Asp Asn Gly Tyr Val Leu Ser Thr  
 85 90 95

Tyr Met Lys Pro Gly Tyr Trp Ser Arg Thr Ser Ser Gly Trp Lys Pro  
 100 105 110

Val Ser Arg Glu Gly Arg Asn Asp Val Ala Tyr Cys Glu Phe Val Thr  
115 120 125

Lys Tyr Ala Lys Ser Phe Ile Pro Gly Glu Gln Gln Met Pro Ala Gln  
130 135 140

Leu Tyr Gln Ser Pro Thr Gly His Glu Leu Glu Ile Ile Pro Leu Ser  
145 150 155 160

Asp Ile Ser Arg Phe Ser Glu Asn Val Lys Leu Lys Val Leu Tyr Lys  
165 170 175

Thr Ser Pro Leu Ala Gly Ala Ile Met Glu Leu Asp Ser Val Ser Tyr  
180 185 190

Leu Thr Ser Ser Arg His Thr His Ala Val Glu His Lys His Pro Val  
195 200 205

His Lys Ala Glu Leu Thr Phe Val Thr Asn Glu Asp Gly Ile Val Thr  
210 215 220

Val Pro Ser Leu His Ile Gly Gln Trp Leu Ala Lys Val Gln Asn Lys  
225 230 235 240

Lys Ser Phe Gln Asp Lys Ser Leu Cys Asp Glu Thr Val Asp Val Ala  
245 250 255

Thr Leu Ser Phe Ser Arg Asn  
260

<210> 24  
<211> 378  
<212> PRT  
<213> Escherichia coli

<400> 24

Met Gly Lys Ile Lys Tyr Trp Leu Ile Val Gly Phe Ile Ile Leu Phe  
1 5 10 15

Ala Ile Phe Tyr Ile Ala Ile Ser Asp Arg Asp Ser Thr Leu Ser Arg  
20 25 30



Leu Lys Ser Ala Gly Glu Asn Gly Asp Val Glu Ala Gln Tyr Ala Leu  
35 40 45

Gly Leu Met Tyr Leu Tyr Gly Glu Ile Leu Asp Val Asp Tyr Gln Gln  
50 55 60

Ala Lys Ile Trp Tyr Glu Lys Ala Ala Asp Gln Asn Asp Pro Arg Ala  
65 70 75 80

Gln Ala Lys Leu Gly Val Met Tyr Ala Asn Gly Leu Gly Val Asn Gln  
85 90 95

Asp Tyr Gln Gln Ser Lys Leu Trp Tyr Glu Lys Ala Ala Ala Gln Asn  
100 105 110

Asp Val Asp Ala Gln Phe Leu Leu Gly Glu Met Tyr Asp Asp Gly Leu  
115 120 125

Gly Val Ser Gln Asp Tyr Gln His Ala Lys Met Trp Tyr Glu Lys Ala  
130 135 140

Ala Ala Gln Asn Asp Glu Arg Ala Gln Val Asn Leu Ala Val Leu Tyr  
145 150 155 160

Ala Lys Gly Asn Gly Val Glu Gln Asp Tyr Arg Gln Ala Lys Ser Trp  
165 170 175

Tyr Glu Lys Ala Ala Ala Gln Asn Ser Pro Asp Ala Gln Phe Ala Leu  
180 185 190

Gly Ile Leu Tyr Ala Asn Ala Asn Gly Val Glu Gln Asp Tyr Gln Gln  
195 200 205

Ala Lys Asp Trp Tyr Glu Lys Ala Ala Glu Gln Asn Phe Ala Asn Ala  
210 215 220

Gln Phe Asn Leu Gly Met Leu Tyr Tyr Lys Gly Glu Gly Val Lys Gln  
225 230 235 240

Asn Phe Arg Gln Ala Arg Glu Trp Phe Glu Lys Ala Ala Ser Gln Asn  
245 250 255

Gln Pro Asn Ala Gln Tyr Asn Leu Gly Gln Ile Tyr Tyr Tyr Gly Gln

260

265

270

Gly Val Thr Gln Ser Tyr Arg Gln Ala Lys Asp Trp Phe Glu Lys Ala  
 275 280 285

Ala Glu Lys Gly His Val Asp Ala Gln Tyr Asn Leu Gly Val Ile Tyr  
 290 295 300

Glu Asn Gly Glu Gly Val Ser Gln Asn Tyr Gln Gln Ala Lys Ala Trp  
 305 310 315 320

Tyr Glu Lys Ala Ala Ser Gln Asn Asp Ala Gln Ala Gln Phe Glu Leu  
 325 330 335

Gly Val Met Asn Glu Leu Gly Gln Gly Glu Ser Ile Asp Leu Lys Gln  
 340 345 350

Ala Arg His Tyr Tyr Glu Arg Ser Cys Asn Asn Gly Leu Lys Lys Gly  
 355 360 365

Cys Glu Arg Leu Lys Glu Leu Leu Tyr Lys  
 370 375

<210> 25  
 <211> 654  
 <212> PRT  
 <213> Escherichia coli

<400> 25

Met Asn Val Ile Arg Thr Val Ile Cys Thr Leu Ile Ile Leu Pro Val  
 1 5 10 15

Gly Leu Gln Ala Ala Thr Ser His Ser Ser Met Val Lys Asp Thr Ile  
 20 25 30

Thr Ile Val Ala Thr Gly Asn Gln Asn Thr Val Phe Glu Thr Pro Ser  
 35 40 45

Met Val Ser Val Val Thr Asn Asp Thr Pro Trp Ser Gln Asn Ala Val  
 50 55 60

Thr Ser Ala Gly Met Leu Lys Gly Val Ala Gly Leu Ser Gln Thr Gly  
 65 70 75 80

Ala Gly Arg Thr Asn Gly Gln Thr Phe Asn Leu Arg Gly Tyr Asp Lys  
85 90 95

Ser Gly Val Leu Val Leu Val Asp Gly Val Arg Gln Leu Ser Asp Met  
100 105 110

Ala Lys Ser Ser Gly Thr Tyr Leu Asp Pro Ala Leu Val Lys Arg Ile  
115 120 125

Glu Val Val Arg Gly Pro Asn Ser Ser Leu Tyr Gly Ser Gly Gly Leu  
130 135 140

Gly Gly Val Val Asp Phe Arg Thr Ala Asp Ala Ala Asp Phe Leu Pro  
145 150 155 160

Pro Gly Glu Thr Asn Gly Leu Ser Leu Trp Gly Asn Ile Ala Ser Gly  
165 170 175

Asp His Ser Thr Gly Ser Gly Leu Thr Trp Phe Gly Lys Thr Gly Lys  
180 185 190

Thr Asp Ala Leu Leu Ser Val Ile Met Arg Lys Arg Gly Asn Ile Tyr  
195 200 205

Gln Ser Asp Gly Glu His Ala Pro Asn Lys Glu Lys Pro Ala Ala Leu  
210 215 220

Phe Ala Lys Gly Ser Val Gly Ile Thr Asp Ser Asn Lys Ala Gly Ala  
225 230 235 240

Ser Leu Arg Leu Tyr Arg Asn Asn Thr Thr Glu Pro Gly Asn Ser Thr  
245 250 255

Gln Thr His Gly Asp Ser Gly Leu Arg Asp Arg Lys Thr Val Gln Asn  
260 265 270

Asp Val Gln Phe Trp Tyr Gln Tyr Ala Pro Val Asp Asn Ser Leu Ile  
275 280 285

Asn Val Lys Ser Thr Leu Tyr Leu Ser Asp Ile Thr Ile Lys Thr Asn  
290 295 300

Gly His Asn Lys Thr Ala Glu Trp Arg Asn Asn Arg Thr Ser Gly Val  
305 310 315 320

Asn Val Val Asn Arg Ser His Thr Leu Ile Phe Pro Gly Ala His Gln  
325 330 335

Leu Ser Tyr Gly Ala Glu Tyr Tyr Arg Gln Gln Gln Lys Pro Glu Gly  
340 345 350

Ser Ala Thr Leu Tyr Pro Glu Gly Asn Ile Asp Phe Thr Ser Leu Tyr  
355 360 365

Phe Gln Asp Glu Met Thr Met Lys Ser Tyr Pro Val Asn Ile Ile Val  
370 375 380

Gly Ser Arg Tyr Asp Arg Tyr Lys Ser Phe Asn Pro Arg Ala Gly Glu  
385 390 395 400

Leu Lys Ala Glu Arg Leu Ser Pro Arg Ala Ala Ile Ser Val Ser Pro  
405 410 415

Thr Asp Trp Leu Met Met Tyr Gly Ser Ile Ser Ser Ala Phe Arg Ala  
420 425 430

Pro Thr Met Ala Glu Met Tyr Arg Asp Asp Val His Phe Tyr Arg Lys  
435 440 445

Gly Lys Pro Asn Tyr Trp Val Pro Asn Leu Asn Leu Lys Pro Glu Asn  
450 455 460

Asn Ile Thr Arg Glu Ile Gly Ala Gly Ile Gln Leu Asp Gly Leu Leu  
465 470 475 480

Thr Asp Asn Asp Arg Leu Gln Leu Lys Gly Gly Tyr Phe Gly Thr Asp  
485 490 495

Ala Arg Asn Tyr Ile Ala Thr Arg Val Asp Met Lys Arg Met Arg Ser  
500 505 510

Tyr Ser Tyr Asn Val Ser Arg Ala Arg Ile Trp Gly Trp Asp Met Gln  
515 520 525

Gly Asn Tyr Gln Ser Asp Tyr Val Asp Trp Met Leu Ser Tyr Asn Arg  
530 535 540

Thr Glu Ser Met Asp Ala Ser Ser Arg Glu Trp Leu Gly Ser Gly Asn  
545 550 555 560

Pro Asp Thr Leu Ile Ser Asp Ile Ser Ile Pro Val Gly His Arg Gly  
565 570 575

Val Tyr Ala Gly Trp Arg Ala Glu Leu Ser Ala Ser Ala Thr His Val  
580 585 590

Lys Lys Gly Asp Pro His Gln Ala Gly Tyr Thr Ile His Ser Phe Ser  
595 600 605

Leu Ser Tyr Lys Pro Val Ser Val Lys Gly Phe Glu Ala Ser Val Thr  
610 615 620

Leu Asp Asn Ala Phe Asn Lys Leu Ala Met Asn Gly Lys Gly Val Pro  
625 630 635 640

Leu Ser Gly Arg Thr Val Ser Leu Tyr Thr Arg Tyr Gln Trp  
645 650

<210> 26  
<211> 1376  
<212> PRT  
<213> Escherichia coli

<400> 26

Met Asn Lys Ile Tyr Ala Leu Lys Tyr Cys Tyr Ile Thr Asn Thr Val  
1 5 10 15

Lys Val Val Ser Glu Leu Ala Arg Arg Val Cys Lys Gly Ser Thr Arg  
20 25 30

Arg Gly Lys Arg Leu Ser Val Leu Thr Ser Leu Ala Leu Ser Ala Leu  
35 40 45

Leu Pro Thr Val Ala Gly Ala Ser Thr Val Gly Gly Asn Asn Pro Tyr  
50 55 60

Gln Thr Tyr Arg Asp Phe Ala Glu Asn Lys Gly Gln Phe Gln Ala Gly  
65 70 75 80

Ala Thr Asn Ile Pro Ile Phe Asn Asn Lys Gly Glu Leu Val Gly His  
85 90 95

Leu Asp Lys Ala Pro Met Val Asp Phe Ser Ser Val Asn Val Ser Ser  
100 105 110

Asn Pro Gly Val Ala Thr Leu Ile Asn Pro Gln Tyr Ile Ala Ser Val  
115 120 125

Lys His Asn Lys Gly Tyr Gln Ser Val Ser Phe Gly Asp Gly Gln Asn  
130 135 140

Ser Tyr His Ile Val Asp Arg Asn Glu His Ser Ser Ser Asp Leu His  
145 150 155 160

Thr Pro Arg Leu Asp Lys Leu Val Thr Glu Val Ala Pro Ala Thr Val  
165 170 175

Thr Ser Ser Ser Thr Ala Asp Ile Leu Asn Pro Ser Lys Tyr Ser Ala  
180 185 190

Phe Tyr Arg Ala Gly Ser Gly Ser Gln Tyr Ile Gln Asp Ser Gln Gly  
195 200 205

Lys Arg His Trp Val Thr Gly Gly Tyr Gly Tyr Leu Thr Gly Gly Ile  
210 215 220

Leu Pro Thr Ser Phe Phe Tyr His Gly Ser Asp Gly Ile Gln Leu Tyr  
225 230 235 240

Met Gly Gly Asn Ile His Asp His Ser Ile Leu Pro Ser Phe Gly Glu  
245 250 255

Ala Gly Asp Ser Gly Ser Pro Leu Phe Gly Trp Asn Thr Ala Lys Gly  
260 265 270

Gln Trp Glu Leu Val Gly Val Tyr Ser Gly Val Gly Gly Gly Thr Asn  
275 280 285

Leu Ile Tyr Ser Leu Ile Pro Gln Ser Phe Leu Ser Gln Ile Tyr Ser  
290 295 300

Glu Asp Asn Asp Ala Pro Val Phe Phe Asn Ala Ser Ser Gly Ala Pro  
305 310 315 320

Leu Gln Trp Lys Phe Asp Ser Ser Thr Gly Thr Gly Ser Leu Lys Gln  
325 330 335

Gly Ser Asp Glu Tyr Ala Met His Gly Gln Lys Gly Ser Asp Leu Asn  
340 345 350

Ala Gly Lys Asn Leu Thr Phe Leu Gly His Asn Gly Gln Ile Asp Leu  
355 360 365

Glu Asn Ser Val Thr Gln Gly Ala Gly Ser Leu Thr Phe Thr Asp Asp  
370 375 380

Tyr Thr Val Thr Thr Ser Asn Gly Ser Thr Trp Thr Gly Ala Gly Ile  
385 390 395 400

Ile Val Asp Lys Asp Ala Ser Val Asn Trp Gln Val Asn Gly Val Lys  
405 410 415

Gly Asp Asn Leu His Lys Ile Gly Glu Gly Thr Leu Val Val Gln Gly  
420 425 430

Thr Gly Val Asn Glu Gly Gly Leu Lys Val Gly Asp Gly Thr Val Val  
435 440 445

Leu Asn Gln Gln Ala Asp Ser Ser Gly His Val Gln Ala Phe Ser Ser  
450 455 460

Val Asn Ile Ala Ser Gly Arg Pro Thr Val Val Leu Ala Asp Asn Gln  
465 470 475 480

Gln Val Asn Pro Asp Asn Ile Ser Trp Gly Tyr Arg Gly Gly Val Leu  
485 490 495

Asp Val Asn Gly Asn Asp Leu Thr Phe His Lys Leu Asn Ala Ala Asp  
500 505 510

Tyr Gly Ala Thr Leu Gly Asn Ser Ser Asp Lys Thr Ala Asn Ile Thr  
515 520 525

Leu Asp Tyr Gln Thr Arg Pro Ala Asp Val Lys Val Asn Glu Trp Ser  
530 535 540

Ser Ser Asn Arg Gly Thr Val Gly Ser Leu Tyr Ile Tyr Asn Asn Pro  
545 550 555 560

Tyr Thr His Thr Val Asp Tyr Phe Ile Leu Lys Thr Ser Ser Tyr Gly  
565 570 575

Trp Phe Pro Thr Gly Gln Val Ser Asn Glu His Trp Glu Tyr Val Gly  
580 585 590

His Asp Gln Asn Ser Ala Gln Ala Leu Leu Ala Asn Arg Ile Asn Asn  
595 600 605

Lys Gly Tyr Leu Tyr His Gly Lys Leu Leu Gly Asn Ile Asn Phe Ser  
610 615 620

Asn Lys Ala Thr Pro Gly Thr Thr Gly Ala Leu Val Met Asp Gly Ser  
625 630 635 640

Ala Asn Met Ser Gly Thr Phe Thr Gln Glu Asn Gly Arg Leu Thr Ile  
645 650 655

Gln Gly His Pro Val Ile His Ala Ser Thr Ser Gln Ser Ile Ala Asn  
660 665 670

Thr Val Ser Ser Leu Gly Asp Asn Ser Val Leu Thr Gln Pro Thr Ser  
675 680 685

Phe Thr Gln Asp Asp Trp Glu Asn Arg Thr Phe Ser Phe Gly Ser Leu  
690 695 700

Val Leu Lys Asp Thr Asp Phe Gly Leu Gly Arg Asn Ala Thr Leu Asn  
705 710 715 720

Thr Thr Ile Gln Ala Asp Asn Ser Ser Val Thr Leu Gly Asp Ser Arg  
725 730 735

Val Phe Ile Asp Lys Lys Asp Gly Gln Gly Thr Ala Phe Thr Leu Glu  
740 745 750

Glu Gly Thr Ser Val Ala Thr Lys Asp Ala Asp Lys Ser Val Phe Asn



755

760

765

Gly Thr Val Asn Leu Asp Asn Gln Ser Val Leu Asn Ile Asn Glu Ile  
 770 775 780

Phe Asn Gly Gly Ile Gln Ala Asn Asn Ser Thr Val Asn Ile Ser Ser  
 785 790 795 800

Asp Ser Ala Val Leu Glu Asn Ser Thr Leu Thr Ser Thr Ala Leu Asn  
 805 810 815

Leu Asn Lys Gly Ala Asn Val Leu Ala Ser Gln Ser Phe Val Ser Asp  
 820 825 830

Gly Pro Val Asn Ile Ser Asp Ala Thr Leu Ser Leu Asn Ser Arg Pro  
 835 840 845

Asp Glu Val Ser His Thr Leu Leu Pro Val Tyr Asp Tyr Ala Gly Ser  
 850 855 860

Trp Asn Leu Lys Gly Asp Asp Ala Arg Leu Asn Val Gly Pro Tyr Ser  
 865 870 875 880

Met Leu Ser Gly Asn Ile Asn Val Gln Asp Lys Gly Thr Val Thr Leu  
 885 890 895

Gly Gly Glu Gly Glu Leu Ser Pro Asp Leu Thr Leu Gln Asn Gln Met  
 900 905 910

Leu Tyr Ser Leu Phe Asn Gly Tyr Arg Asn Thr Trp Ser Gly Ser Leu  
 915 920 925

Asn Ala Pro Asp Ala Thr Val Ser Met Thr Asp Thr Gln Trp Ser Met  
 930 935 940

Asn Gly Asn Ser Thr Ala Gly Asn Met Lys Leu Asn Arg Thr Ile Val  
 945 950 955 960

Gly Phe Asn Gly Gly Thr Ser Ser Phe Thr Thr Leu Thr Thr Asp Asn  
 965 970 975

Leu Asp Ala Val Gln Ser Ala Phe Val Met Arg Thr Asp Leu Asn Lys  
 980 985 990

Ala Asp Lys Leu Val Ile Asn Lys Ser Ala Thr Gly His Asp Asn Ser  
995 1000 1005

Ile Trp Val Asn Phe Leu Lys Lys Pro Ser Asp Lys Asp Thr Leu  
1010 1015 1020

Asp Ile Pro Leu Val Ser Ala Pro Glu Ala Thr Ala Asp Asn Leu  
1025 1030 1035

Phe Arg Ala Ser Thr Arg Val Val Gly Phe Ser Asp Val Thr Pro  
1040 1045 1050

Thr Leu Ser Val Arg Lys Glu Asp Gly Lys Lys Glu Trp Val Leu  
1055 1060 1065

Asp Gly Tyr Gln Val Ala Arg Asn Asp Gly Gln Gly Lys Ala Ala  
1070 1075 1080

Ala Thr Phe Met His Ile Ser Tyr Asn Asn Phe Ile Thr Glu Val  
1085 1090 1095

Asn Asn Leu Asn Lys Arg Met Gly Asp Leu Arg Asp Ile Asn Gly  
1100 1105 1110

Glu Ala Gly Thr Trp Val Arg Leu Leu Asn Gly Ser Gly Ser Ala  
1115 1120 1125

Asp Gly Gly Phe Thr Asp His Tyr Thr Leu Leu Gln Met Gly Ala  
1130 1135 1140

Asp Arg Lys His Glu Leu Gly Ser Met Asp Leu Phe Thr Gly Val  
1145 1150 1155

Met Ala Thr Tyr Thr Asp Thr Asp Ala Ser Ala Gly Leu Tyr Ser  
1160 1165 1170

Gly Lys Thr Lys Ser Trp Gly Gly Gly Phe Tyr Ala Ser Gly Leu  
1175 1180 1185

Phe Arg Ser Gly Ala Tyr Phe Asp Leu Ile Ala Lys Tyr Ile His  
1190 1195 1200

Asn Glu Asn Lys Tyr Asp Leu Asn Phe Ala Gly Ala Gly Lys Gln  
1205 1210 1215

Asn Phe Arg Ser His Ser Leu Tyr Ala Gly Ala Glu Val Gly Tyr  
1220 1225 1230

Arg Tyr His Leu Thr Asp Thr Thr Phe Val Glu Pro Gln Ala Glu  
1235 1240 1245

Leu Val Trp Gly Arg Leu Gln Gly Gln Thr Phe Asn Trp Asn Asp  
1250 1255 1260

Ser Gly Met Asp Val Ser Met Arg Arg Asn Ser Val Asn Pro Leu  
1265 1270 1275

Val Gly Arg Thr Gly Val Val Ser Gly Lys Thr Phe Ser Gly Lys  
1280 1285 1290

Asp Trp Ser Leu Thr Ala Arg Ala Gly Leu His Tyr Glu Phe Asp  
1295 1300 1305

Leu Thr Asp Ser Ala Asp Val His Leu Lys Asp Ala Ala Gly Glu  
1310 1315 1320

His Gln Ile Asn Gly Arg Lys Asp Gly Arg Met Leu Tyr Gly Val  
1325 1330 1335

Gly Leu Asn Ala Arg Phe Gly Asp Asn Thr Arg Leu Gly Leu Glu  
1340 1345 1350

Val Glu Arg Ser Ala Phe Gly Lys Tyr Asn Thr Asp Asp Ala Ile  
1355 1360 1365

Asn Ala Asn Ile Arg Tyr Ser Phe  
1370 1375

<210> 27  
<211> 349  
<212> PRT  
<213> Escherichia coli

<400> 27

Met Ile Thr Leu Phe Arg Leu Leu Ala Ile Leu Cys Leu Phe Phe Asn

1	5	10	15
Val Ser Ala	Phe Ala Val Asp Cys Tyr	Gln Asp Gly Tyr	Arg Gly Thr
	20	25	30
Thr Leu Ile	Asn Gly Asp Leu Pro Thr	Phe Lys Ile Pro	Glu Asn Ala
	35	40	45
Gln Pro Gly	Gln Lys Ile Trp Glu Ser	Gly Asp Ile Asn	Ile Thr Val
	50	55	60
Tyr Cys Asp	Asn Ala Pro Gly Trp Ser	Ser Asn Asn Pro	Ser Glu Asn
	65	70	75
Val Tyr Ala	Trp Ile Lys Leu Pro Gln	Ile Asn Ser Ala	Asp Met Leu
	85	90	95
Asn Asn Pro	Tyr Leu Thr Phe Gly Val	Thr Tyr Asn Gly	Val Asp Tyr
	100	105	110
Glu Gly Thr	Asn Glu Lys Ile Asp Thr	His Ala Cys Leu	Asp Lys Tyr
	115	120	125
Glu Gln Tyr	Tyr Asn Gly Tyr Tyr His	Asp Pro Val Cys	Asn Gly Ser
	130	135	140
Thr Leu Gln	Lys Asn Val Thr Phe Asn	Ala His Phe Arg	Val Tyr Val
	145	150	155
Lys Phe Lys	Ser Arg Pro Ala Gly Asp	Gln Thr Val Asn	Phe Gly Thr
	165	170	175
Val Asn Val	Leu Gln Phe Asp Gly Glu	Gly Gly Ala Asn	Met Ala Pro
	180	185	190
Asn Ala Lys	Asn Leu Arg Tyr Ala Ile	Thr Gly Leu Asp	Asn Ile Ser
	195	200	205
Phe Leu Asp	Cys Ser Val Asp Val Arg	Ile Ser Pro Glu	Ser Gln Ile
	210	215	220
Val Asn Phe	Gly Gln Ile Ala Ala Asn	Ser Ile Ala Thr	Phe Pro Pro
	225	230	235
			240

Lys Ala Ala Phe Ser Val Ser Thr Ile Lys Asp Ile Ala Ser Asp Cys  
245 250 255

Thr Glu Gln Phe Asp Val Ala Thr Ser Phe Phe Thr Ser Asp Thr Leu  
260 265 270

Tyr Asp Asn Thr His Leu Glu Ile Gly Asn Gly Leu Leu Met Arg Ile  
275 280 285

Thr Asp Gln Lys Thr Gln Glu Asp Ile Lys Phe Asn Gln Phe Lys Leu  
290 295 300

Phe Ser Thr Tyr Ile Pro Gly Gln Ser Ala Ala Met Ala Thr Arg Asp  
305 310 315 320

Tyr Gln Ala Glu Leu Thr Gln Lys Pro Gly Glu Pro Leu Val Tyr Gly  
325 330 335

Pro Phe Gln Lys Asp Leu Ile Val Lys Ile Asn Tyr His  
340 345

<210> 28  
<211> 840  
<212> PRT  
<213> Escherichia coli

<400> 28

Met Asn Asn Lys Asn Thr Phe Ser Arg Asp Lys Leu Ser His Ala Ile  
1 5 10 15

Lys Asn Ala Leu Ser Gly Val Val Cys Ser Leu Leu Phe Val Leu Pro  
20 25 30

Val His Ala Val Glu Phe Asn Val Asp Met Ile Asp Ala Glu Asp Arg  
35 40 45

Glu Asn Ile Asp Ile Ser Arg Phe Glu Lys Lys Gly Tyr Ile Pro Pro  
50 55 60

Gly Arg Tyr Leu Val Arg Val Gln Ile Asn Lys Asn Met Leu Pro Gln  
65 70 75 80

Thr Leu Ile Leu Glu Trp Val Lys Ala Asp Asn Glu Ser Gly Ser Leu  
85 90 95

Leu Cys Leu Thr Lys Glu Asn Leu Thr Asn Phe Gly Leu Asn Thr Glu  
100 105 110

Phe Ile Glu Ser Leu Gln Asn Ile Ala Gly Ser Glu Cys Leu Asp Leu  
115 120 125

Ser Gln Arg Gln Glu Leu Thr Thr Arg Leu Asp Lys Ala Thr Met Ile  
130 135 140

Leu Ser Leu Ser Val Pro Gln Ala Trp Leu Lys Tyr Gln Ala Thr Asn  
145 150 155 160

Trp Thr Pro Pro Glu Phe Trp Asp Thr Gly Ile Thr Gly Phe Ile Leu  
165 170 175

Asp Tyr Asn Val Tyr Ala Ser Gln Tyr Ala Pro His His Gly Asp Ser  
180 185 190

Thr Gln Asn Val Ser Ser Tyr Gly Thr Leu Gly Phe Asn Leu Gly Ala  
195 200 205

Trp Arg Leu Arg Ser Asp Tyr Gln Tyr Asn Gln Asn Phe Ala Asp Gly  
210 215 220

Arg Ser Val Asn Arg Asp Ser Glu Phe Ala Arg Thr Tyr Leu Phe Arg  
225 230 235 240

Pro Ile Pro Ser Trp Ser Ser Lys Phe Thr Met Gly Gln Tyr Asp Leu  
245 250 255

Ser Ser Asn Leu Tyr Asp Thr Phe His Phe Thr Gly Ala Ser Leu Glu  
260 265 270

Ser Asp Glu Ser Met Leu Pro Pro Asp Leu Gln Gly Tyr Ala Pro Gln  
275 280 285

Ile Thr Gly Ile Ala Gln Thr Asn Ala Lys Val Thr Val Ala Gln Asn  
290 295 300

Gly Arg Val Leu Tyr Gln Thr Thr Val Ala Pro Gly Pro Phe Thr Ile

305		310		315		320
Ser Asp Leu Gly Gln	Ser Phe Gln Gly	Gln Leu Asp Val	Thr Val Glu			
325		330	335			
Glu Glu Asp Gly Arg	Thr Ser Thr Phe	Gln Val Gly Ser	Ala Ser Ile			
340		345	350			
Pro Tyr Leu Thr Arg	Lys Gly Gln Val	Arg Tyr Lys Thr	Ser Leu Gly			
355		360	365			
Lys Pro Thr Ser Val	Gly His Asn Asp	Ile Asn Asn Pro	Phe Phe Trp			
370		375	380			
Thr Ala Glu Ala Ser	Trp Gly Trp Leu	Asn Asn Val Ser	Leu Tyr Gly			
385		390	395			400
Gly Gly Met Phe Thr	Ala Asp Asp Tyr	Gln Ala Ile Thr	Thr Gly Ile			
	405	410	415			
Gly Phe Asn Leu Asn	Gln Phe Gly Ser	Leu Ser Phe Asp	Val Thr Gly			
	420	425	430			
Ala Asp Ala Ser Leu	Gln Gln Gln Asn	Ser Gly Asn Leu	Arg Gly Tyr			
	435	440	445			
Ser Tyr Arg Phe Asn	Tyr Ala Lys His	Phe Glu Ser Thr	Gly Ser Gln			
	450	455	460			
Ile Thr Phe Ala Gly	Tyr Arg Phe Ser	Asp Lys Asp Tyr	Val Ser Met			
465		470	475			480
Ser Glu Tyr Leu Ser	Ser Arg Asn Gly	Asp Glu Ser Ile	Asp Asn Glu			
	485	490	495			
Lys Glu Ser Tyr Val	Ile Ser Leu Asn	Gln Tyr Phe Glu	Thr Leu Glu			
	500	505	510			
Leu Asn Ser Tyr Leu	Asn Val Thr Arg	Asn Thr Tyr Trp	Asp Ser Ala			
	515	520	525			
Ser Asn Thr Asn Tyr	Ser Val Ser Val	Ser Lys Asn Phe	Asp Ile Gly			
	530	535	540			

Asp Phe Lys Gly Ile Ser Ala Ser Leu Ala Val Ser Arg Ile Arg Trp  
545 550 555 560

Asp Asp Asp Glu Glu Asn Gln Tyr Tyr Phe Ser Phe Ser Leu Pro Leu  
565 570 575

Gln Gln Asn Arg Asn Ile Ser Tyr Ser Met Gln Arg Thr Gly Ser Ser  
580 585 590

Asn Thr Ser Gln Met Ile Ser Trp Tyr Asp Ser Ser Asp Arg Asn Asn  
595 600 605

Ile Trp Asn Ile Ser Ala Ser Ala Thr Asp Asp Asn Ile Arg Asp Gly  
610 615 620

Glu Pro Thr Leu Arg Gly Ser Tyr Gln His Tyr Ser Pro Trp Gly Arg  
625 630 635 640

Leu Asn Ile Asn Gly Ser Val Gln Pro Asn Gln Tyr Asn Ser Val Thr  
645 650 655

Ala Gly Trp Tyr Gly Ser Leu Thr Ala Thr Arg His Gly Val Ala Leu  
660 665 670

His Asp Tyr Ser Tyr Gly Asp Asn Ala Arg Met Met Val Asp Thr Asp  
675 680 685

Gly Ile Ser Gly Ile Glu Ile Asn Ser Asn Arg Thr Val Thr Asn Gly  
690 695 700

Leu Gly Ile Ala Val Ile Pro Ser Leu Ser Asn Tyr Thr Thr Ser Met  
705 710 715 720

Leu Arg Val Asn Asn Asn Asp Leu Pro Glu Gly Val Asp Val Glu Asn  
725 730 735

Ser Val Ile Arg Thr Thr Leu Thr Gln Gly Ala Ile Gly Tyr Ala Lys  
740 745 750

Leu Asn Ala Thr Thr Gly Tyr Gln Ile Val Gly Val Ile Arg Gln Glu  
755 760 765



Asn Gly Arg Phe Pro Pro Leu Gly Val Asn Val Thr Asp Lys Ala Thr  
770 775 780

Gly Lys Asp Val Gly Leu Val Ala Glu Asp Gly Phe Val Tyr Leu Ser  
785 790 795 800

Gly Ile Gln Glu Asn Ser Ile Leu His Leu Thr Trp Gly Asp Asn Thr  
805 810 815

Cys Glu Val Thr Pro Pro Asn Gln Ser Asn Ile Ser Glu Ser Ala Ile  
820 825 830

Ile Leu Pro Cys Lys Thr Val Lys  
835 840

<210> 29  
<211> 169  
<212> PRT  
<213> Escherichia coli

<400> 29

Leu Met Asn Thr Lys Gln Ser Val Ala Gln Leu Ala Val Pro His Arg  
1 5 10 15

Lys Arg Leu Ser Ser Thr Met Val Val Ala Leu Leu Leu Cys Val Val  
20 25 30

Ala Gly Ala Val Met Ile Asn Ala Ala Asp Phe Pro Ala Thr Ala Ile  
35 40 45

Glu Thr Asp Pro Gly Ala Ser Ala Phe Pro Thr Phe Tyr Ala Cys Ala  
50 55 60

Leu Ile Val Leu Ala Val Leu Leu Val Ile Arg Asp Leu Leu Gln Ala  
65 70 75 80

Lys Pro Ala Ser Cys Ala Asn Ala Gln Glu Lys Pro Ala Phe Arg Lys  
85 90 95

Thr Ala Thr Gly Ile Ala Ala Thr Ala Phe Tyr Ile Val Ala Met Ser  
100 105 110

Tyr Cys Gly Tyr Leu Ile Thr Thr Pro Val Phe Leu Ile Val Ile Met

115

120

125

Thr Leu Met Gly Tyr Arg Arg Trp Val Leu Thr Pro Gly Ile Ala Leu  
 130 135 140

Leu Leu Thr Ala Ile Leu Trp Leu Leu Phe Val Glu Ala Leu Gln Val  
 145 150 155 160

Pro Leu Pro Val Gly Thr Phe Phe Glu  
 165

<210> 30  
 <211> 311  
 <212> PRT  
 <213> Escherichia coli

<400> 30

Met Val Leu Leu Ala Gly Ala Ala Leu Ser Ile Ala Pro Val Gln Ala  
 1 5 10 15

Ala Ser Tyr Pro Thr Lys Gln Ile Glu Leu Val Val Pro Tyr Ala Ala  
 20 25 30

Gly Gly Gly Thr Asp Leu Val Ala Arg Ala Phe Ala Asp Ala Ala Lys  
 35 40 45

Asn His Leu Pro Val Ser Ile Gly Val Ile Asn Lys Pro Gly Gly Gly  
 50 55 60

Gly Ala Ile Gly Leu Ser Glu Ile Ala Ala Ala Arg Pro Asn Gly Tyr  
 65 70 75 80

Lys Ile Gly Leu Gly Thr Val Glu Leu Thr Thr Leu Pro Ser Leu Gly  
 85 90 95

Met Val Arg Phe Lys Thr Ser Asp Phe Lys Pro Ile Ala Arg Leu Asn  
 100 105 110

Ala Asp Pro Ala Ala Ile Thr Val Arg Ala Asp Ala Pro Trp Asn Ser  
 115 120 125

Tyr Glu Glu Phe Met Ala Tyr Ser Lys Ala Asn Pro Gly Lys Val Arg  
 130 135 140

Ile Gly Asn Ser Gly Thr Gly Ala Ile Trp His Leu Ala Ala Ala Ala  
145 150 155 160

Leu Glu Asp Lys Thr Gly Thr Lys Phe Ser His Val Pro Tyr Asp Gly  
165 170 175

Ala Ala Pro Ala Ile Thr Gly Leu Leu Gly Gly His Ile Glu Ala Val  
180 185 190

Ser Val Ser Pro Gly Glu Val Ile Asn His Val Asn Gly Gly Lys Leu  
195 200 205

Lys Thr Leu Val Val Met Ala Asp Glu Arg Met Lys Thr Met Pro Asp  
210 215 220

Val Pro Thr Leu Lys Glu Lys Gly Val Asp Leu Ser Ile Gly Thr Trp  
225 230 235 240

Arg Gly Leu Ile Val Ser Gln Lys Thr Pro Gln Asp Val Val Asp Val  
245 250 255

Leu Ala Lys Ala Ala Lys Glu Thr Ala Glu Glu Pro Ala Phe Gln Asp  
260 265 270

Ala Leu Gln Lys Leu Asn Leu Asn Tyr Ala Trp Leu Asp Ala Ala Ser  
275 280 285

Phe Gln Thr Gln Ile Ser Glu Gln Glu Lys Tyr Phe Asp Glu Leu Leu  
290 295 300

Thr Arg Leu Gly Leu Lys Lys  
305 310

<210> 31  
<211> 722  
<212> PRT  
<213> Escherichia coli

<400> 31

Met Leu Arg Trp Lys Arg Cys Ile Ile Leu Thr Phe Ile Ser Gly Ala  
1 5 10 15

Ala Phe Ala Ala Pro Glu Ile Asn Val Lys Gln Asn Glu Ser Leu Pro

20										25										30									
Asp	Leu	Gly	Ser	Gln	Ala	Ala	Gln	Gln	Asp	Glu	Gln	Thr	Asn	Lys	Gly														
		35					40					45																	
Lys	Ser	Leu	Lys	Glu	Arg	Gly	Ala	Asp	Tyr	Val	Ile	Asn	Ser	Ala	Thr														
	50					55					60																		
Gln	Gly	Phe	Glu	Asn	Leu	Thr	Pro	Glu	Ala	Leu	Glu	Ser	Gln	Ala	Arg														
	65				70					75					80														
Ser	Tyr	Leu	Gln	Ser	Gln	Ile	Thr	Ser	Thr	Ala	Gln	Ser	Tyr	Ile	Glu														
				85					90					95															
Asp	Thr	Leu	Ser	Pro	Tyr	Gly	Lys	Val	Arg	Leu	Asn	Leu	Ser	Ile	Gly														
		100						105					110																
Gln	Gly	Gly	Asp	Leu	Asp	Gly	Ser	Ser	Ile	Asp	Tyr	Phe	Val	Pro	Trp														
		115					120					125																	
Tyr	Asp	Asn	Gln	Thr	Thr	Val	Tyr	Phe	Ser	Gln	Phe	Ser	Ala	Gln	Arg														
	130					135					140																		
Lys	Glu	Asp	Arg	Thr	Ile	Gly	Asn	Ile	Gly	Leu	Gly	Val	Arg	Tyr	Asn														
	145				150					155					160														
Phe	Asp	Lys	Tyr	Leu	Leu	Gly	Gly	Asn	Ile	Phe	Tyr	Asp	Tyr	Asp	Phe														
				165					170					175															
Thr	Arg	Gly	His	Arg	Arg	Leu	Gly	Leu	Gly	Ala	Glu	Ala	Trp	Thr	Asp														
			180					185					190																
Tyr	Leu	Lys	Phe	Ser	Gly	Asn	Tyr	Tyr	His	Pro	Leu	Ser	Asp	Trp	Lys														
		195				200						205																	
Asp	Ser	Glu	Asp	Phe	Asp	Phe	Tyr	Glu	Glu	Arg	Pro	Ala	Arg	Gly	Trp														
	210					215					220																		
Asp	Ile	Arg	Ala	Glu	Val	Trp	Leu	Pro	Ser	Tyr	Pro	Gln	Leu	Gly	Gly														
	225				230					235				240															
Lys	Ile	Val	Phe	Glu	Gln	Tyr	Tyr	Gly	Asp	Glu	Val	Ala	Leu	Phe	Gly														
			245						250					255															

Thr Asp Asn Leu Glu Lys Asp Pro Tyr Ala Val Thr Leu Gly Leu Asn  
260 265 270

Tyr Gln Pro Val Pro Leu Leu Thr Val Gly Thr Asp Tyr Lys Ala Gly  
275 280 285

Thr Gly Asp Asn Ser Asp Val Ser Ile Asn Ala Thr Leu Asn Tyr Gln  
290 295 300

Phe Gly Val Pro Leu Lys Asp Gln Leu Asp Ser Asp Lys Val Lys Ala  
305 310 315 320

Ala His Ser Leu Met Gly Ser Arg Leu Asp Phe Val Glu Arg Asn Asn  
325 330 335

Phe Ile Val Leu Glu Tyr Lys Glu Lys Asp Pro Leu Asp Val Thr Leu  
340 345 350

Trp Leu Lys Ala Asp Ala Thr Asn Glu His Pro Glu Cys Val Ile Lys  
355 360 365

Asp Thr Pro Glu Ala Ala Val Gly Leu Glu Lys Cys Lys Trp Thr Ile  
370 375 380

Asn Ala Leu Ile Asn His His Tyr Lys Ile Val Ala Ala Ser Trp Gln  
385 390 395 400

Ala Lys Asn Asn Ala Ala Arg Thr Leu Val Met Pro Val Ile Lys Glu  
405 410 415

Asn Thr Leu Thr Glu Gly Asn Asn Asn His Trp Asn Leu Val Leu Pro  
420 425 430

Ala Trp Gln Tyr Ser Ser Asp Gln Ala Glu Gln Glu Lys Leu Asn Thr  
435 440 445

Trp Arg Val Arg Leu Ala Leu Glu Asp Glu Lys Gly Asn Arg Gln Asn  
450 455 460

Ser Gly Val Val Glu Ile Thr Val Gln Gln Asp Arg Lys Ile Glu Leu  
465 470 475 480

Ile Val Asn Asn Ile Ala Asn Pro Glu Glu Asn Asn His Ser His Glu  
485 490 495

Ala Ser Ala Gln Ala Asp Gly Val Asp Gly Val Val Met Asp Leu Asp  
500 505 510

Val Thr Asp Ser Phe Gly Asp Asn Thr Asp Arg Asn Gly Asp Ala Leu  
515 520 525

Pro Glu Asp Asn Leu Thr Pro Gln Leu Tyr Asp Ala Gln Asp Lys Arg  
530 535 540

Val Thr Leu Thr Asn Lys Pro Cys Ser Thr Asp Asn Pro Cys Val Phe  
545 550 555 560

Ile Ala Lys Gln Asp Lys Glu Lys Gly Thr Val Thr Leu Ser Ser Thr  
565 570 575

Leu Pro Gly Thr Tyr Arg Trp Lys Ala Lys Ala Ala Pro Tyr Asp Asp  
580 585 590

Ser Asn Tyr Val Asp Val Thr Phe Leu Gly Ala Glu Ile Gly Gly Leu  
595 600 605

Asn Ala Phe Ile Tyr Arg Val Gly Ala Ala Lys Pro Ser Asn Leu Ile  
610 615 620

Gly Lys Asp Lys Glu Pro Leu Pro Ser Thr Thr Phe Ile Asp Leu Phe  
625 630 635 640

Tyr Gly Ala Thr Thr Ile Lys Thr Val Ser Ser Ser Arg Ser Lys Asn  
645 650 655

Leu Thr Lys Arg Trp Cys Ser Thr Thr Thr Ser Gly Asn Leu Pro Ala  
660 665 670

Arg Ala Ser Met Val Ser Gly Cys Thr Gly Glu His Ser Asn Glu Asp  
675 680 685

Ile Val Ile Pro Ala Thr Asn Arg Glu Ala Ala Gln Thr Tyr Gly Ala  
690 695 700

Gln Ala Gly Asp Gly Leu Gln Gly Tyr Gly Leu Arg Val Leu Tyr Thr  
705 710 715 720

Lys Lys

<210> 32  
<211> 319  
<212> PRT  
<213> Escherichia coli

<400> 32

Met Lys Gln Asp Lys Arg Arg Gly Leu Thr Arg Ile Ala Leu Ala Leu  
1 5 10 15

Ala Leu Ala Gly Tyr Cys Val Ala Pro Val Ala Leu Ala Glu Asp Ser  
20 25 30

Ala Trp Val Asp Ser Gly Glu Thr Asn Ile Phe Gln Gly Thr Ile Pro  
35 40 45

Trp Leu Tyr Ser Glu Gly Gly Ser Ala Thr Thr Asp Ala Asp Arg Val  
50 55 60

Thr Leu Thr Ser Asp Leu Lys Gly Ala Arg Pro Gln Gly Met Lys Arg  
65 70 75 80

Thr Ser Val Phe Thr Arg Val Ile Asn Ile Gly Asp Thr Glu Gly Asp  
85 90 95

Val Asp Leu Gly Gly Leu Gly Asp Asn Ala Lys Thr Ile Asp Thr Ile  
100 105 110

Arg Trp Met Ser Tyr Lys Asp Ala Gln Gly Gly Asp Pro Lys Glu Leu  
115 120 125

Ala Thr Lys Val Thr Ser Tyr Thr Leu Thr Asp Ala Asp Arg Gly Arg  
130 135 140

Tyr Ile Gly Ile Glu Ile Thr Pro Thr Thr Gln Thr Gly Thr Pro Asn  
145 150 155 160

Val Gly Thr Ala Leu His Leu Tyr Asp Val Ser Thr Ala Ser Gly Gly  
165 170 175

Gly Ser Asp Ser Asp Asn Val Ala Pro Gly Pro Val Val Asn Gln Asn  
180 185 190

Leu Lys Val Ala Ile Phe Val Asp Gly Thr Ser Ile Asn Leu Ile Asn  
195 200 205

Gly Ser Thr Pro Ile Glu Leu Gly Lys Thr Tyr Val Ala Lys Leu Tyr  
210 215 220

Ser Asp Glu Asn Lys Asn Gly Lys Phe Asp Ala Gly Thr Asp Ala Asp  
225 230 235 240

Val Thr Ala Asn Tyr Asp Phe Arg Trp Val Leu Ser Gly Ser Ser Gln  
245 250 255

Gln Leu Gly Thr Ser Gly Gly Ile Val Asn Ser Ser Phe Asp Asn Asn  
260 265 270

Asn Leu Val Ile Pro Ala Thr Asn Asp Glu Ala Arg Thr Asn Leu Asn  
275 280 285

Gly Pro Ala Arg Asp Gly Lys Glu Ala Leu Ser Ile Pro Thr Asn Gly  
290 295 300

Asp Gly Val Gln Gly Tyr Lys Leu His Ile Ile Tyr Lys His Lys  
305 310 315

<210> 33  
<211> 629  
<212> PRT  
<213> Escherichia coli

<400> 33

Met Lys Lys Val Leu Thr Leu Ser Leu Leu Ala Leu Cys Val Ser His  
1 5 10 15

Ser Ala Val Ala Ala Asn Tyr Thr Phe Asn Asn Asp Asn Ile Ala Leu  
20 25 30

Ser Phe Asp Asp Thr Asn Ser Thr Ile Val Leu Lys Asp Arg Arg Thr  
35 40 45



Asn His Pro Ile Thr Pro Gln Glu Leu Phe Phe Leu Thr Leu Pro Asp  
50 55 60

Glu Thr Lys Ile His Thr Ala Asp Phe Lys Ile Lys His Ile Lys Lys  
65 70 75 80

Gln Asp Asn Ala Ile Val Ile Asp Phe Thr Arg Pro Asp Phe Asn Val  
85 90 95

Thr Val Gln Leu Asn Leu Val Lys Gly Lys Tyr Ala Ser Ile Asp Tyr  
100 105 110

Thr Ile Ala Ala Val Gly Gln Pro Arg Asp Val Ala Lys Ile Thr Phe  
115 120 125

Phe Pro Thr Lys Lys Gln Phe Gln Ala Pro Tyr Val Asp Gly Ala Ile  
130 135 140

Thr Ser Ser Pro Ile Ile Ala Asp Ser Phe Phe Ile Leu Pro Asn Lys  
145 150 155 160

Pro Ile Val Asn Thr Tyr Ala Tyr Glu Ala Thr Thr Asn Leu Asn Val  
165 170 175

Glu Leu Lys Thr Pro Ile Gln Pro Glu Thr Pro Val Ser Phe Thr Thr  
180 185 190

Trp Phe Gly Thr Phe Pro Glu Thr Ser Gln Leu Arg Arg Ser Val Asn  
195 200 205

Gln Phe Ile Asn Ala Val Arg Pro Arg Pro Tyr Lys Pro Tyr Leu His  
210 215 220

Tyr Asn Ser Trp Met Asp Ile Gly Phe Phe Thr Pro Tyr Thr Glu Gln  
225 230 235 240

Asp Val Leu Gly Arg Met Asp Glu Trp Asn Lys Glu Phe Ile Ser Gly  
245 250 255

Arg Gly Val Ala Leu Asp Ala Phe Leu Leu Asp Asp Gly Trp Asp Asp  
260 265 270

Leu Thr Gly Arg Trp Leu Phe Gly Pro Ala Phe Ser Asn Gly Phe Ser

275

280

285

Lys Val Arg Glu Lys Ala Asp Ser Leu His Ser Ser Val Gly Leu Trp  
 290 295 300

Leu Ser Pro Trp Gly Gly Tyr Asn Lys Pro Gln Arg Arg Ser Arg Phe  
 305 310 315 320

Ala Cys Lys Arg Val Trp Val Arg Asn Arg Gly Arg Gln Ala Gly Ala  
 325 330 335

Phe Gly Ser Glu Leu Leu Lys Asn Phe Asn Glu Gln Ile Ile Asn Leu  
 340 345 350

Ile Lys Asn Glu His Ile Thr Ser Phe Lys Leu Asp Gly Met Gly Asn  
 355 360 365

Ala Ser Ser His Ile Lys Gly Ser Pro Phe Ala Ser Asp Phe Asp Ala  
 370 375 380

Ser Ile Ala Leu Leu His Asn Met Arg Arg Ala Asn Pro Asn Leu Phe  
 385 390 395 400

Ile Asn Leu Thr Thr Gly Thr Asn Ala Ser Pro Ser Trp Leu Phe Tyr  
 405 410 415

Ala Asp Ser Ile Trp Arg Gln Gly Asp Asp Ile Asn Leu Tyr Gly Pro  
 420 425 430

Gly Thr Pro Val Gln Gln Trp Ile Thr Tyr Arg Asp Ala Glu Thr Tyr  
 435 440 445

Arg Ser Ile Val Arg Lys Gly Pro Leu Phe Pro Leu Asn Ser Leu Met  
 450 455 460

Tyr His Gly Ile Val Ser Ala Glu Asn Ala Tyr Tyr Gly Leu Glu Lys  
 465 470 475 480

Val Gln Thr Asp Ser Asp Phe Ala Asp Gln Val Trp Ser Tyr Phe Ala  
 485 490 495

Thr Gly Thr Gln Leu Gln Glu Leu Tyr Ile Thr Pro Ser Met Leu Asn  
 500 505 510

Lys Val Lys Trp Asp Thr Leu Ala Lys Ala Ala Lys Trp Ser Lys Glu  
515 520 525

Asn Ala Ser Val Leu Val Asp Thr His Trp Ile Gly Gly Asp Pro Thr  
530 535 540

Ala Leu Ala Val Tyr Gly Trp Ala Ser Trp Ser Lys Asp Lys Ala Ile  
545 550 555 560

Leu Gly Leu Arg Asn Pro Ser Asp Lys Pro Gln Thr Tyr Tyr Leu Asp  
565 570 575

Leu Ala Lys Asp Phe Glu Ile Pro Ala Gly Asn Ala Ala Gln Phe Ser  
580 585 590

Leu Lys Ala Val Tyr Gly Ser Asn Lys Thr Val Pro Val Glu Tyr Lys  
595 600 605

Asn Ala Thr Val Ile Thr Leu Gln Pro Leu Glu Thr Leu Val Phe Glu  
610 615 620

Ala Val Thr Ile Asn  
625

<210> 34  
<211> 1778  
<212> PRT  
<213> Escherichia coli

<400> 34

Met Asn Lys Ile Phe Lys Val Ile Trp Asn Pro Ala Thr Gly Ser Tyr  
1 5 10 15

Thr Val Ala Ser Glu Thr Ala Lys Ser Arg Gly Lys Lys Ser Gly Arg  
20 25 30

Ser Lys Leu Leu Ile Ser Ala Leu Val Ala Gly Gly Leu Leu Ser Ser  
35 40 45

Phe Gly Ala Ser Ala Asp Asn Tyr Thr Gly Gln Pro Thr Asp Tyr Gly  
50 55 60

Asp Gly Ser Ala Gly Asp Gly Trp Val Ala Ile Gly Lys Gly Ala Lys  
65 70 75 80

Ala Asn Thr Phe Met Asn Thr Ser Gly Ala Ser Thr Ala Leu Gly Tyr  
85 90 95

Asp Ala Ile Ala Glu Gly Glu Tyr Ser Ser Ala Ile Gly Ser Lys Thr  
100 105 110

Leu Ala Thr Gly Gly Ala Ser Met Ala Phe Gly Val Ser Ala Lys Ala  
115 120 125

Met Gly Asp Arg Ser Val Ala Leu Gly Ala Ser Ser Val Ala Asn Gly  
130 135 140

Asp Arg Ser Met Ala Phe Gly Arg Tyr Ala Lys Thr Asn Gly Phe Thr  
145 150 155 160

Ser Leu Ala Ile Gly Asp Ser Ser Leu Ala Asp Gly Glu Lys Thr Ile  
165 170 175

Ala Leu Gly Asn Thr Ala Lys Ala Tyr Glu Ile Met Ser Ile Ala Leu  
180 185 190

Gly Asp Asn Ala Asn Ala Ser Lys Glu Tyr Ala Met Ala Leu Gly Ala  
195 200 205

Ser Ser Lys Ala Gly Gly Ala Asp Ser Leu Ala Phe Gly Arg Lys Ser  
210 215 220

Thr Ala Asn Ser Thr Gly Ser Leu Ala Ile Gly Ala Asp Ser Ser Ser  
225 230 235 240

Ser Asn Asp Asn Ala Ile Ala Ile Gly Asn Lys Thr Gln Ala Leu Gly  
245 250 255

Val Asn Ser Met Ala Leu Gly Asn Ala Ser Gln Ala Ser Gly Glu Ser  
260 265 270

Ser Ile Ala Leu Gly Asn Thr Ser Glu Ala Ser Glu Gln Asn Ala Ile  
275 280 285

Ala Leu Gly Gln Gly Ser Ile Ala Ser Lys Val Asn Ser Ile Ala Leu  
290 295 300

Gly Ser Asn Ser Leu Ser Ser Gly Glu Asn Ala Ile Ala Leu Gly Glu  
305 310 315 320

Gly Ser Ala Ala Gly Gly Ser Asn Ser Leu Ala Phe Gly Ser Gln Ser  
325 330 335

Arg Ala Asn Gly Asn Asp Ser Val Ala Ile Gly Val Gly Ala Ala Ala  
340 345 350

Ala Thr Asp Asn Ser Val Ala Ile Gly Ala Gly Ser Thr Thr Asp Ala  
355 360 365

Ser Asn Thr Val Ser Val Gly Asn Ser Ala Thr Lys Arg Lys Ile Val  
370 375 380

Asn Met Ala Ala Gly Ala Ile Ser Asn Thr Ser Thr Asp Ala Ile Asn  
385 390 395 400

Gly Ser Gln Leu Tyr Thr Ile Ser Asp Ser Val Ala Lys Arg Leu Gly  
405 410 415

Gly Gly Ala Thr Val Gly Ser Asp Gly Thr Val Thr Ala Val Ser Tyr  
420 425 430

Ala Leu Arg Ser Gly Thr Tyr Asn Asn Val Gly Asp Ala Leu Ser Gly  
435 440 445

Ile Asp Asn Asn Thr Leu Gln Trp Asn Lys Thr Ala Gly Ala Phe Ser  
450 455 460

Ala Asn His Gly Ala Asn Ala Thr Asn Lys Ile Thr Asn Val Ala Lys  
465 470 475 480

Gly Thr Val Ser Ala Thr Ser Thr Asp Val Val Asn Gly Ser Gln Leu  
485 490 495

Tyr Asp Leu Gln Gln Asp Ala Leu Leu Trp Asn Gly Thr Ala Phe Ser  
500 505 510

Ala Ala His Gly Thr Glu Ala Thr Ser Lys Ile Thr Asn Val Thr Ala

515

520

525

Gly Asn Leu Thr Ala Gly Ser Thr Asp Ala Val Asn Gly Ser Gln Leu  
530 535 540

Lys Thr Thr Asn Asp Asn Val Thr Thr Asn Thr Thr Asn Ile Ala Thr  
545 550 555 560

Asn Thr Thr Asn Ile Thr Asn Leu Thr Asp Ala Val Asn Gly Leu Gly  
565 570 575

Asp Asp Ser Leu Leu Trp Asn Lys Ala Ala Gly Ala Phe Ser Ala Ala  
580 585 590

His Gly Thr Glu Ala Thr Ser Lys Ile Thr Asn Val Thr Ala Gly Asn  
595 600 605

Leu Thr Ala Gly Ser Thr Asp Ala Val Asn Gly Ser Gln Leu Lys Thr  
610 615 620

Thr Asn Asp Asn Val Thr Thr Asn Thr Thr Asn Ile Ala Thr Asn Thr  
625 630 635 640

Thr Asn Ile Thr Asn Leu Thr Asp Ala Val Asn Gly Leu Gly Asp Asp  
645 650 655

Ser Leu Leu Trp Asn Lys Thr Ala Gly Ala Phe Ser Ala Ala His Gly  
660 665 670

Thr Asp Ala Thr Ser Lys Ile Thr Asn Val Thr Ala Gly Asn Leu Thr  
675 680 685

Ala Gly Ser Thr Asp Ala Val Asn Gly Ser Gln Leu Lys Thr Thr Asn  
690 695 700

Asp Asn Val Thr Thr Asn Thr Thr Asn Ile Ala Thr Asn Thr Thr Asn  
705 710 715 720

Ile Thr Asn Leu Thr Asp Ala Val Asn Gly Leu Gly Asp Asp Ser Leu  
725 730 735

Leu Trp Asn Lys Thr Ala Gly Ala Phe Ser Ala Ala His Gly Thr Asp  
740 745 750

Ala Thr Ser Lys Ile Thr Asn Val Lys Ala Gly Asp Leu Thr Ala Gly  
755 760 765

Ser Thr Asp Ala Val Asn Gly Ser Gln Leu Lys Thr Thr Asn Asp Asn  
770 775 780

Val Ser Thr Asn Thr Thr Asn Ile Thr Asn Leu Thr Asp Ala Val Asn  
785 790 795 800

Gly Leu Gly Asp Asp Ser Leu Leu Trp Asn Lys Thr Ala Gly Ala Phe  
805 810 815

Ser Ala Ala His Gly Thr Asp Ala Thr Ser Lys Ile Thr Asn Val Lys  
820 825 830

Ala Gly Asp Leu Thr Ala Gly Ser Thr Asp Ala Val Asn Gly Ser Gln  
835 840 845

Leu Lys Thr Thr Asn Asp Asn Val Ser Thr Asn Thr Thr Asn Ile Thr  
850 855 860

Asn Leu Thr Asp Ser Val Gly Asp Leu Lys Asp Asp Ser Leu Leu Trp  
865 870 875 880

Asn Lys Ala Ala Gly Ala Phe Ser Ala Ala His Gly Thr Glu Ala Thr  
885 890 895

Ser Lys Ile Thr Asn Leu Leu Ala Gly Lys Ile Ser Ser Asn Ser Thr  
900 905 910

Asp Ala Ile Asn Gly Ser Gln Leu Tyr Gly Val Ala Asp Ser Phe Thr  
915 920 925

Ser Tyr Leu Gly Gly Gly Ala Asp Ile Ser Asp Thr Gly Val Leu Ser  
930 935 940

Gly Pro Thr Tyr Thr Ile Gly Gly Thr Asp Tyr Thr Asn Val Gly Asp  
945 950 955 960

Ala Leu Ala Ala Ile Asn Thr Ser Phe Ser Thr Ser Leu Gly Asp Ala  
965 970 975

Leu Leu Trp Asp Ala Thr Ala Gly Lys Phe Ser Ala Lys His Gly Ile  
 980 985 990

Asn Asn Ala Pro Ser Val Ile Thr Asp Val Ala Asn Gly Ala Val Ser  
 995 1000 1005

Ser Thr Ser Ser Asp Ala Ile Asn Gly Ser Gln Leu Tyr Gly Val  
 1010 1015 1020

Ser Asp Tyr Ile Ala Asp Ala Leu Gly Gly Asn Ala Val Val Asn  
 1025 1030 1035

Thr Asp Gly Ser Ile Thr Thr Pro Thr Tyr Ala Ile Ala Gly Gly  
 1040 1045 1050

Ser Tyr Asn Asn Val Gly Asp Ala Leu Glu Ala Ile Asp Thr Thr  
 1055 1060 1065

Leu Asp Asp Ala Leu Leu Trp Asp Thr Thr Ala Asn Gly Gly Asn  
 1070 1075 1080

Gly Ala Phe Ser Ala Ala His Gly Lys Asp Lys Thr Ala Ser Val  
 1085 1090 1095

Ile Thr Asn Val Ala Asn Gly Ala Val Ser Ala Thr Ser Asn Asp  
 1100 1105 1110

Ala Ile Asn Gly Ser Gln Leu Tyr Ser Thr Asn Lys Tyr Ile Ala  
 1115 1120 1125

Asp Ala Leu Gly Gly Asp Ala Glu Val Asn Ala Asp Gly Thr Ile  
 1130 1135 1140

Thr Ala Pro Thr Tyr Thr Ile Ala Asn Thr Asp Tyr Asn Asn Val  
 1145 1150 1155

Gly Glu Ala Leu Asp Ala Leu Asp Asn Asn Ala Leu Leu Trp Asp  
 1160 1165 1170

Glu Asp Ala Gly Ala Tyr Asn Ala Ser His Asp Gly Asn Ala Ser  
 1175 1180 1185



Lys Ile Thr Asn Val Ala Ala Gly Asp Leu Ser Thr Thr Ser Thr  
1190 1195 1200

Asp Ala Val Asn Gly Ser Gln Leu Asn Ala Thr Asn Ile Leu Val  
1205 1210 1215

Thr Gln Asn Ser Gln Met Ile Asn Gln Leu Ala Gly Asn Thr Ser  
1220 1225 1230

Glu Thr Tyr Ile Glu Glu Asn Gly Ala Gly Ile Asn Tyr Val Arg  
1235 1240 1245

Thr Asn Asp Ser Gly Leu Ala Phe Asn Asp Ala Ser Ala Ser Gly  
1250 1255 1260

Ile Gly Ala Thr Ala Val Gly Tyr Asn Ala Val Ala Ser His Ala  
1265 1270 1275

Ser Ser Val Ala Ile Gly Gln Asp Ser Ile Ser Glu Val Asp Thr  
1280 1285 1290

Gly Ile Ala Leu Gly Ser Ser Ser Val Ser Ser Arg Val Ile Val  
1295 1300 1305

Lys Gly Thr Arg Asn Thr Ser Val Ser Glu Glu Gly Val Val Ile  
1310 1315 1320

Gly Tyr Asp Thr Thr Asp Gly Glu Leu Leu Gly Ala Leu Ser Ile  
1325 1330 1335

Gly Asp Asp Gly Lys Tyr Arg Gln Ile Ile Asn Val Ala Asp Gly  
1340 1345 1350

Ser Glu Ala His Asp Ala Val Thr Val Arg Gln Leu Gln Asn Ala  
1355 1360 1365

Ile Gly Ala Val Ala Thr Thr Pro Thr Lys Tyr Tyr His Ala Asn  
1370 1375 1380

Ser Thr Ala Glu Asp Ser Leu Ala Val Gly Glu Asp Ser Leu Ala  
1385 1390 1395

Met Gly Ala Lys Thr Ile Val Asn Gly Asn Ala Gly Ile Gly Ile  
1400 1405 1410

Gly Leu Asn Thr Leu Val Leu Ala Asp Ala Ile Asn Gly Ile Ala  
1415 1420 1425

Ile Gly Ser Asn Ala Arg Ala Asn His Ala Asp Ser Ile Ala Met  
1430 1435 1440

Gly Asn Gly Ser Gln Thr Thr Arg Gly Ala Gln Thr Asn Tyr Thr  
1445 1450 1455

Ala Tyr Asn Met Asp Ala Pro Gln Asn Ser Val Gly Glu Phe Ser  
1460 1465 1470

Val Gly Ser Glu Asp Gly Gln Arg Gln Ile Thr Asn Val Ala Ala  
1475 1480 1485

Gly Ser Ala Asp Thr Asp Ala Val Asn Val Gly Gln Leu Lys Val  
1490 1495 1500

Thr Asp Ala Gln Val Ser Gln Asn Thr Gln Ser Ile Thr Asn Leu  
1505 1510 1515

Asn Thr Gln Val Thr Asn Leu Asp Thr Arg Val Thr Asn Ile Glu  
1520 1525 1530

Asn Gly Ile Gly Asp Ile Val Thr Thr Gly Ser Thr Lys Tyr Phe  
1535 1540 1545

Lys Thr Asn Thr Asp Gly Ala Asp Ala Asn Ala Gln Gly Lys Asp  
1550 1555 1560

Ser Val Ala Ile Gly Ser Gly Ser Ile Ala Ala Ala Asp Asn Ser  
1565 1570 1575

Val Ala Leu Gly Thr Gly Ser Val Ala Asp Glu Glu Asn Thr Ile  
1580 1585 1590

Ser Val Gly Ser Ser Thr Asn Gln Arg Arg Ile Thr Asn Val Ala  
1595 1600 1605

Ala Gly Val Asn Ala Thr Asp Ala Val Asn Val Ser Gln Leu Lys  
1610 1615 1620

Ser Ser Glu Ala Gly Gly Val Arg Tyr Asp Thr Lys Ala Asp Gly  
1625 1630 1635

Ser Ile Asp Tyr Ser Asn Ile Thr Leu Gly Gly Gly Asn Ser Gly  
1640 1645 1650

Thr Thr Arg Ile Ser Asn Val Ser Ala Gly Val Asn Asn Asn Asp  
1655 1660 1665

Ala Val Asn Tyr Ala Gln Leu Lys Gln Ser Val Gln Glu Thr Lys  
1670 1675 1680

Gln Tyr Thr Asp Gln Arg Met Val Glu Met Asp Asn Lys Leu Ser  
1685 1690 1695

Lys Thr Glu Ser Lys Leu Ser Gly Gly Ile Ala Ser Ala Met Ala  
1700 1705 1710

Met Thr Gly Leu Pro Gln Ala Tyr Thr Pro Gly Ala Ser Met Ala  
1715 1720 1725

Ser Ile Gly Gly Gly Thr Tyr Asn Gly Glu Ser Ala Val Ala Leu  
1730 1735 1740

Gly Val Ser Met Val Ser Ala Asn Gly Arg Trp Val Tyr Lys Leu  
1745 1750 1755

Gln Gly Ser Thr Asn Ser Gln Gly Glu Tyr Ser Ala Ala Leu Gly  
1760 1765 1770

Ala Gly Ile Gln Trp  
1775

<210> 35  
<211> 227  
<212> PRT  
<213> Escherichia coli

<400> 35

Met Asn Leu Lys Lys Thr Leu Leu Ser Val Leu Met Ile Leu Gln Leu

1	5	10	15
Cys Leu Leu Val Gly Cys Asp Tyr Ile Glu Lys Ala Ser Lys Val Asp	20	25	30
Asp Leu Val Thr Gln Gln Glu Leu Gln Lys Ser Lys Ile Glu Ala Leu	35	40	45
Glu Lys Gln Gln Glu Leu Asp Lys Arg Lys Ile Glu His Phe Glu Lys	50	55	60
Gln Gln Thr Thr Ile Ile Asn Ser Thr Lys Thr Leu Ala Gly Val Val	65	70	75
Lys Ala Val Lys Asn Lys Gln Asp Glu Phe Val Phe Thr Glu Phe Asn	85	90	95
Pro Ala Gln Thr Gln Tyr Phe Ile Leu Asn Asn Gly Ser Val Gly Leu	100	105	110
Ala Gly Lys Ile Leu Ser Ile Asp Ala Val Glu Asn Gly Ser Val Ile	115	120	125
Arg Ile Ser Leu Val Asn Leu Leu Ser Val Pro Val Ser Asn Met Gly	130	135	140
Phe Tyr Ala Thr Trp Gly Gly Glu Lys Pro Thr Asp Ile Asn Ala Leu	145	150	155
Ala Lys Trp Gln Gln Leu Leu Phe Ser Thr Ala Met Asn Ser Ser Leu	165	170	175
Lys Leu Leu Pro Gly Gln Trp Gln Asp Ile Asn Leu Thr Leu Lys Gly	180	185	190
Val Ser Pro Asn Asn Leu Lys Tyr Leu Lys Leu Ala Ile Asn Met Ala	195	200	205
Asn Ile Gln Phe Asp Arg Leu Gln Pro Ala Glu Ser Pro Gln Arg Lys	210	215	220
Asn Lys Lys	225		

<210> 36  
<211> 1109  
<212> PRT  
<213> Escherichia coli

<400> 36

Met Lys Arg Val Val Arg Leu Leu Gly Val Gly Leu Leu Leu Leu Val  
1 5 10 15

Val Leu Leu Leu Ile Leu Phe Val Leu Ala Gln Thr Thr Pro Leu Ile  
20 25 30

Ser Ala Gln Asp Glu His Ala Val Trp Leu Arg Leu Leu Ile Thr Ala  
35 40 45

Ile Val Ile Cys Leu Leu Ser Met Cys Ile Phe Phe Leu Phe Ser Phe  
50 55 60

Arg Gln Asn Glu Ala Ser Thr Ile Ser Leu Tyr Ala Gln Pro Thr Asp  
65 70 75 80

Ile Lys Glu Ile Asn Thr Glu Gln Pro Asn Tyr Ala Ser Leu Leu Thr  
85 90 95

Ile Tyr Leu Arg Asp Arg Tyr Gly Pro Phe Trp Arg Arg Lys Val Arg  
100 105 110

Leu Leu Leu Val Thr Gly Glu Pro Glu Gln Ala Glu Ala Ile Ala Pro  
115 120 125

Gly Leu Thr Gly Gln His Trp Leu Glu Gly Asp His Thr Val Leu Ile  
130 135 140

Tyr Gly Gly Arg Pro Thr Ala Glu Pro Asp Val Thr Leu Leu Thr Ala  
145 150 155 160

Leu Lys Lys Leu Arg Arg Ser Arg Pro Leu Asp Gly Ile Ile Trp Ala  
165 170 175

Leu Thr Glu Glu Gln Ser Arg Gln Thr Ala Gln Leu Asp Lys Gly Trp  
180 185 190

Arg Gly Leu Ile Asn Gly Gly Lys Arg Leu Gly Phe Gln Ala Pro Leu

195	200	205
Tyr Leu Trp Gln Val Cys Asp Asp Gly Asp Tyr Gln Thr Gly Arg Pro		
210	215	220
Leu Gln Ser Val Gly Cys Leu Leu Pro Glu Arg Cys Thr Pro Glu Gln		
225	230	235 240
Leu Ala Val Met Leu Glu Ala Ala Ala Asp Gly Thr Gly His Val Ala		
	245	250 255
Ala Thr Asp Arg Tyr Arg Met Phe Ser Ala Ala Ser Gly Ser Tyr Pro		
	260	265 270
Cys Arg Ala Gly Tyr Cys Ser Leu Ala Asp Arg Pro Glu Thr Ala Ala		
	275	280 285
Gly Arg Arg Arg Ile Phe Phe Pro Ala Pro Ala Arg Pro Asp Val Gln		
	290	295 300
Pro Ala Ala Cys Arg Arg Ala Gly Gly Gln His Leu Met Gln Trp Leu		
305	310	315 320
Pro Ser Pro Val Trp Ala Gly Val Thr Val Ile Thr Arg Ala Gly Ala		
	325	330 335
Arg Trp Val Phe Leu Trp Leu Arg Thr Ala Leu Met Ser Ala Val Cys		
	340	345 350
Val Leu Val Ile Trp Gly Ala Gly Met Thr Thr Ser Phe Phe Ala Asn		
	355	360 365
Arg Ala Leu Val Gln Glu Thr Gly Ile Gln Thr Ala Arg Ala Leu Asp		
	370	375 380
Thr Arg Leu Pro Leu Ala Glu Gln Leu Val Ala Leu His Thr Leu Gln		
385	390	395 400
Gly Glu Leu Glu Arg Leu Gln Tyr Arg Ile Arg Glu Gly Ala Pro Trp		
	405	410 415
Tyr Gln Arg Phe Gly Leu Glu Arg Asn Gln Gln Leu Leu Ala Ala Ala		
	420	425 430

Phe Pro Gly Tyr Ala Gln Ala Ala Asn Arg Leu Val Arg Asp Val Ala  
435 440 445

Val Asp His Leu Gln Gln Gln Leu Asn Ala Phe Val Ala Leu Pro Pro  
450 455 460

Asn Ser Pro Gln Arg Thr Ala Thr Gly Glu Gln Arg Tyr Lys Gln Leu  
465 470 475 480

Lys Ala Leu Leu Met Thr Ser Arg Pro Glu Lys Ala Asp Ala Ala Phe  
485 490 495

Phe Ser Thr Thr Leu Met Ala Asp Gly Leu Arg Tyr Glu Asn Ile Pro  
500 505 510

Glu Gly Val Arg Gln Ser Val Leu Pro Ser Leu Leu Thr Phe Trp Thr  
515 520 525

Ala Asn Leu Pro Glu His Pro Gln Trp Lys Thr Ser Pro Pro Pro Glu  
530 535 540

Leu Thr Gly Ala Val Arg Lys Ile Leu Leu Arg Gln Ile Gly Val Arg  
545 550 555 560

Asn Ala Glu Asn Thr Leu Tyr Gln Asn Val Leu Gln Gln Val Ser Arg  
565 570 575

Asn Tyr Ala Asp Met Thr Leu Ala Asp Met Thr Gly Asp Thr Leu Thr  
580 585 590

Glu Ser Leu Phe Ser Thr Glu Gln Thr Val Pro Gly Met Phe Thr Arg  
595 600 605

Gln Ala Trp Glu Gly Gln Val Arg Glu Ala Ile Glu Gln Val Val Thr  
610 615 620

Ala Arg Arg Glu Glu Ile Asp Trp Val Leu Ser Asp Arg Gln Gln Asp  
625 630 635 640

Thr Ser Ala Asp Ile Ser Pro Asp Thr Leu Arg Asn Arg Leu Thr Ser  
645 650 655

Arg Tyr Phe Thr Asp Phe Ala Gly Ser Trp Leu Ala Phe Leu Asn Ser  
660 665 670

Ile His Trp Lys Lys Glu Asp Ser Leu Ser Gly Ile Leu Asp Gln Leu  
675 680 685

Thr Leu Met Ala Asp Ala Arg Gln Ser Pro Leu Ile Ala Leu Thr Asp  
690 695 700

Thr Leu Ala Trp Gln Ala Ala Thr Gly Arg Glu Asn Arg Gly Leu Ser  
705 710 715 720

Asp Ser Leu Ala Lys Ser Ala Gln Glu Leu Phe Asn Gly Lys Glu Lys  
725 730 735

Thr Pro Gln Gln Ser Arg Glu Gly Asp Asp Val Pro Val Gly Pro Leu  
740 745 750

Asp Lys Thr Phe Thr Pro Leu Leu Arg Leu Leu Gly Asp Lys Ala Gly  
755 760 765

Gly Gly Asp Ser Gln Leu Ser Leu Gln Thr Tyr Leu Thr Arg Val Thr  
770 775 780

Arg Val Arg Leu Lys Leu Gln Gln Val Thr Asn Ala Pro Asp Pro Gln  
785 790 795 800

Glu Met Thr Gln Gln Leu Ala Gln Thr Val Leu Gln Gly Lys Thr Val  
805 810 815

Asp Leu Thr Asp Thr Arg Asp Tyr Gly Arg Leu Ile Ala Ala Ser Leu  
820 825 830

Gly Glu Glu Trp Ser Gly Phe Gly Gln Ala Leu Phe Val Arg Pro Val  
835 840 845

Glu Gln Ser Trp Arg Gln Val Leu Thr Pro Ala Ala Asp Ser Leu Asn  
850 855 860

Arg Gln Trp Gln Arg Ala Ile Val Ser His Trp Asn Gln Asp Phe Ala  
865 870 875 880

Gly Arg Tyr Pro Phe Lys Ala Ser Gln Asn Asp Ala Ser Leu Pro Leu



885

890

895

Leu Ala Gln Tyr Leu Arg Asp Asp Gly Arg Ile Asn Leu Phe Ile Ala  
 900 905 910

Ala Asn Leu Ser Gly Val Leu Lys Arg Glu Gly Arg Tyr Trp Val Ala  
 915 920 925

Asp Ala Met Asn Thr Gln Gly Leu Thr Val Asn Pro Asp Phe Ile Arg  
 930 935 940

Ala Leu Asn Arg Leu Arg Asp Val Ala Asp Thr Ala Phe Ala Ser Gly  
 945 950 955 960

Asp Ala Gly Ile His Phe Glu Leu Arg Ala Lys Pro Ala Arg Asp Val  
 965 970 975

Met Lys Thr His Leu Val Ile Asp Gly Gln Glu Leu Glu Tyr Phe Asn  
 980 985 990

Gln Lys Glu Arg Trp Gln Arg Phe Asn Trp Pro Asp Glu Gln Trp Gln  
 995 1000 1005

Pro Gly Ala Ser Leu Ser Trp Thr Ser Thr Gln Ala Met Glu Arg  
 1010 1015 1020

Ile Leu Ala Asp Tyr Arg Gly Ser Trp Ser Leu Ile Arg Leu Leu  
 1025 1030 1035

Glu Gln Ala Gln Val Thr Pro Val Asp Ser Ser Thr Phe Lys Val  
 1040 1045 1050

Val Trp Lys Ala Gln Asp Gly Leu Pro Leu Asn Tyr Leu Leu Arg  
 1055 1060 1065

Val Glu Gln Gly Lys Gly Pro Leu Ala Leu Leu Glu Leu Lys Asn  
 1070 1075 1080

Phe Arg Leu Pro Gly Gln Val Phe Leu Thr Gly Lys Ser Met Lys  
 1085 1090 1095

Asp Val Glu Glu Tyr Gly Glu Asp Ala Asp Glu  
 1100 1105

<210> 37  
<211> 178  
<212> PRT  
<213> Escherichia coli

<400> 37

Met Phe Pro Ile Arg Phe Lys Arg Pro Ala Leu Leu Cys Met Ala Met  
1 5 10 15

Leu Thr Val Val Leu Ser Gly Cys Gly Leu Ile Gln Lys Val Val Asp  
20 25 30

Glu Ser Lys Ser Val Ala Ser Ala Val Phe Tyr Lys Gln Ile Lys Ile  
35 40 45

Leu His Leu Asp Phe Phe Ser Arg Ser Ala Leu Asn Thr Asp Ala Glu  
50 55 60

Asp Thr Pro Leu Ser Thr Met Val His Val Trp Gln Leu Lys Thr Arg  
65 70 75 80

Glu Asp Phe Asp Lys Ala Asp Tyr Asp Thr Leu Phe Met Gln Glu Glu  
85 90 95

Lys Thr Leu Glu Lys Asp Val Leu Ala Lys His Thr Val Trp Val Lys  
100 105 110

Pro Glu Gly Thr Ala Ser Leu Asn Val Pro Leu Asp Lys Glu Thr Gln  
115 120 125

Phe Val Ala Ile Ile Gly Gln Phe Tyr His Pro Asp Glu Lys Ser Asp  
130 135 140

Ser Trp Arg Leu Val Ile Lys Arg Asp Glu Leu Glu Ala Asp Lys Pro  
145 150 155 160

Arg Ser Ile Glu Leu Met Arg Ser Asp Leu Arg Leu Leu Pro Leu Lys  
165 170 175

Asp Lys

<210> 38  
<211> 280  
<212> PRT  
<213> Escherichia coli

<400> 38

Met Ile Ser Gly Gly Asn Met Leu Lys Glu Trp Met Ile Phe Thr Cys  
1 5 10 15

Ser Leu Leu Thr Leu Ala Gly Ala Ser Leu Pro Leu Ser Gly Cys Ile  
20 25 30

Ser Arg Gly Gln Glu Ser Ile Ser Glu Gly Ala Ala Phe Gly Ala Gly  
35 40 45

Ile Leu Arg Glu Pro Gly Ala Thr Lys Lys Ala Asp Thr Lys Asp Leu  
50 55 60

Asn Val Pro Pro Pro Val Tyr Gly Pro Pro Gln Val Ile Phe Arg Ile  
65 70 75 80

Asp Asp Asn Arg Tyr Phe Thr Leu Glu Asn Tyr Thr His Cys Glu Asn  
85 90 95

Gly Gln Thr Phe Tyr Asn Asn Lys Ala Lys Asn Ile His Val Lys Ile  
100 105 110

Leu Asp Ala Ser Gly Tyr Leu Phe Lys Gly Arg Leu Phe Trp Leu Ser  
115 120 125

Thr Arg Asp Asp Phe Leu Ala Phe Pro Ala Thr Leu Asn Thr Arg His  
130 135 140

Ala Ser Cys Met Gly Ser Asn Lys Gly Cys Met Asn Ala Val Ile Val  
145 150 155 160

Thr Thr Asp Gly Gly Lys Arg Arg Ser Gly Val Pro Tyr Gly Ser Tyr  
165 170 175

Thr Gln Asn Pro Thr Gly Ala Thr Arg Asp Tyr Asp Met Leu Val Met  
180 185 190

Asn Asp Gly Phe Tyr Leu Leu Arg Tyr Arg Gly Gly Gln Gly Arg Phe  
195 200 205

Ser Pro Val Ile Leu Arg Trp Ile Leu Ser Thr Glu Asp Ser Ser Gly  
210 215 220

Val Val Arg Ser Glu Asp Ala Tyr Glu Leu Phe Arg Pro Gly Glu Glu  
225 230 235 240

Val Pro Ser Thr Gly Phe Tyr Lys Ile Asp Leu Ser Arg Phe Tyr Pro  
245 250 255

Lys Asn Asn Val Met Glu Met Gln Cys Asp Arg Thr Leu Glu Pro Val  
260 265 270

Gln Pro Ser Glu Ser Lys Ile Gln  
275 280

<210> 39  
<211> 501  
<212> PRT  
<213> Escherichia coli

<400> 39

Met Glu His Val Ser Ile Lys Thr Leu Tyr His Leu Leu Cys Cys Met  
1 5 10 15

Leu Leu Phe Ile Ser Ala Met Cys Ala Leu Ala Gln Glu His Glu Pro  
20 25 30

Ile Gly Ala Gln Asp Glu Arg Leu Ser Thr Leu Ile His Gln Arg Met  
35 40 45

Gln Glu Ala Lys Val Pro Ala Leu Ser Val Ser Val Thr Ile Lys Gly  
50 55 60

Val Arg Gln Arg Phe Val Tyr Gly Val Ala Asp Val Ala Ser Gln Lys  
65 70 75 80

Ala Asn Thr Leu Asp Thr Val Tyr Glu Leu Gly Ser Met Ser Lys Ala  
85 90 95

Phe Thr Gly Leu Val Val Gln Ile Leu Ile Gln Glu Gly Arg Leu Arg  
100 105 110

Gln Gly Asp Asp Ile Ile Thr Tyr Leu Pro Glu Met Arg Leu Asn Tyr  
115 120 125

Gln Gly Lys Pro Ala Ser Leu Thr Val Ala Asp Phe Leu Tyr His Thr  
130 135 140

Ser Gly Leu Pro Phe Ser Thr Leu Ala Arg Leu Glu Asn Pro Met Pro  
145 150 155 160

Gly Ser Ala Val Ala Gln Gln Leu Arg Asn Glu Asn Leu Leu Phe Ala  
165 170 175

Pro Gly Ala Lys Phe Ser Tyr Ala Ser Ala Asn Tyr Asp Val Leu Gly  
180 185 190

Ala Val Ile Glu Asn Val Thr Gly Lys Thr Phe Thr Glu Val Ile Ala  
195 200 205

Glu Arg Leu Thr Gln Pro Leu Gly Met Ser Ala Thr Val Ala Val Lys  
210 215 220

Gly Asp Glu Ile Ile Val Asn Lys Ala Ser Gly Tyr Lys Leu Gly Phe  
225 230 235 240

Gly Lys Pro Val Leu Phe His Ala Pro Leu Ala Arg Asn His Val Pro  
245 250 255

Ala Ala Tyr Ile His Ser Thr Leu Pro Asp Met Glu Ile Trp Ile Asp  
260 265 270

Ala Trp Leu His Arg Lys Ala Leu Pro Ala Thr Leu Arg Glu Ala Met  
275 280 285

Ser Asn Ser Trp Arg Gly Asn Ser Asp Val Pro Leu Ala Ala Asp Asn  
290 295 300

Arg Ile Leu Tyr Ala Ser Gly Trp Phe Ile Asp Gln Asn Gln Gly Pro  
305 310 315 320

Tyr Ile Ser His Gly Gly Gln Asn Pro Asn Phe Ser Ser Cys Ile Ala  
325 330 335

Leu Arg Pro Asp Gln Gln Ile Gly Ile Val Ala Leu Ala Asn Met Asn

340

345

350

Ser Asn Leu Ile Leu Gln Leu Cys Ala Asp Ile Asp Asn Tyr Leu Arg  
 355 360 365

Ile Gly Lys Tyr Ala Asp Gly Ala Gly Asp Ala Ile Thr Ala Thr Asp  
 370 375 380

Thr Leu Phe Val Tyr Leu Thr Leu Leu Leu Cys Phe Trp Gly Ala Val  
 385 390 395 400

Val Val Val Arg Gly Ala Phe Arg Val Tyr Arg Ala Thr Ala His Gly  
 405 410 415

Pro Gly Lys Gln Gln Arg Leu Arg Leu Arg Val Arg Asp Tyr Ile Ile  
 420 425 430

Ala Leu Ala Val Pro Gly Leu Val Ala Ala Met Leu Tyr Val Ala Pro  
 435 440 445

Gly Ile Leu Ser Pro Gly Leu Asp Trp Arg Phe Ile Leu Val Trp Gly  
 450 455 460

Pro Ser Ser Val Leu Ala Ile Pro Phe Gly Ile Ile Leu Leu Ala Phe  
 465 470 475 480

Val Leu Thr Leu Asn His Gln Ile Lys Arg Ile Leu Leu His Asn Lys  
 485 490 495

Glu Trp Asp Asp Glu  
 500

<210> 40  
 <211> 682  
 <212> PRT  
 <213> Escherichia coli

<400> 40

Met Lys Asn Lys Tyr Ile Ile Ala Pro Gly Ile Ala Val Met Cys Ser  
 1 5 10 15

Ala Val Ile Ser Ser Gly Tyr Ala Ser Ser Asp Lys Lys Glu Asp Thr  
 20 25 30

Leu Val Val Thr Ala Ser Gly Phe Thr Gln Gln Leu Arg Asn Ala Pro  
35 40 45

Ala Ser Val Ser Val Ile Thr Ser Glu Gln Leu Gln Lys Lys Pro Val  
50 55 60

Ser Asp Leu Val Asp Ala Val Lys Asp Val Glu Gly Ile Ser Ile Thr  
65 70 75 80

Gly Gly Asn Glu Lys Pro Asp Ile Ser Ile Arg Gly Leu Ser Gly Asp  
85 90 95

Tyr Thr Leu Ile Leu Val Asp Gly Arg Arg Gln Ser Gly Arg Glu Ser  
100 105 110

Arg Pro Asn Gly Ser Gly Gly Phe Glu Ala Gly Phe Ile Pro Pro Val  
115 120 125

Glu Ala Ile Glu Arg Ile Glu Val Ile Arg Gly Pro Met Ser Ser Leu  
130 135 140

Tyr Gly Ser Asp Ala Ile Gly Gly Val Ile Asn Ile Ile Thr Lys Pro  
145 150 155 160

Val Asn Asn Gln Thr Trp Asp Gly Val Leu Gly Leu Gly Gly Ile Ile  
165 170 175

Gln Glu His Gly Lys Phe Gly Asn Ser Thr Thr Asn Asp Phe Tyr Leu  
180 185 190

Ser Gly Pro Leu Ile Lys Asp Lys Leu Gly Leu Gln Leu Tyr Gly Gly  
195 200 205

Met Asn Tyr Arg Lys Glu Asp Ser Ile Ser Gln Gly Thr Pro Ala Lys  
210 215 220

Asp Asn Lys Asn Ile Thr Ala Thr Leu Gln Phe Thr Pro Thr Glu Ser  
225 230 235 240

Gln Lys Phe Val Phe Glu Tyr Gly Lys Asn Asn Gln Val His Thr Leu  
245 250 255

Thr Pro Gly Glu Ser Leu Asp Ala Trp Thr Met Arg Gly Asn Leu Lys  
260 265 270

Gln Pro Asn Ser Lys Arg Glu Thr His Asn Ser Arg Ser His Trp Val  
275 280 285

Ala Ala Trp Asn Ala Gln Gly Glu Ile Leu His Pro Glu Ile Ala Val  
290 295 300

Tyr Gln Glu Lys Val Ile Arg Glu Val Lys Ser Gly Lys Lys Asp Lys  
305 310 315 320

Tyr Asn His Trp Asp Leu Asn Tyr Glu Ser Arg Lys Pro Glu Ile Thr  
325 330 335

Asn Thr Ile Ile Asp Ala Lys Val Thr Ala Phe Leu Pro Glu Asn Val  
340 345 350

Leu Thr Ile Gly Gly Gln Phe Gln His Ala Glu Leu Arg Asp Asp Ser  
355 360 365

Ala Thr Gly Lys Lys Thr Thr Glu Thr Gln Ser Val Ser Ile Lys Gln  
370 375 380

Lys Ala Val Phe Ile Glu Asn Glu Tyr Ala Ala Thr Asp Ser Leu Ala  
385 390 395 400

Leu Thr Gly Gly Leu Arg Leu Asp Asn His Glu Ile Tyr Gly Ser Tyr  
405 410 415

Trp Asn Pro Arg Leu Tyr Ala Val Tyr Asn Leu Thr Asp Asn Leu Thr  
420 425 430

Leu Lys Gly Gly Ile Ala Lys Ala Phe Arg Ala Pro Ser Ile Arg Glu  
435 440 445

Val Ser Pro Gly Phe Gly Thr Leu Thr Gln Gly Gly Ala Ser Ile Met  
450 455 460

Tyr Gly Asn Arg Asp Leu Lys Pro Glu Thr Ser Val Thr Glu Glu Ile  
465 470 475 480

Gly Ile Ile Tyr Ser Asn Asp Ser Gly Phe Ser Ala Ser Ala Thr Leu



485

490

495

Phe Asn Thr Asp Phe Lys Asn Lys Leu Thr Ser Tyr Asp Ile Gly Thr  
 500 505 510

Lys Asp Pro Val Thr Gly Leu Asn Thr Phe Ile Tyr Asp Asn Val Gly  
 515 520 525

Glu Ala Asn Ile Arg Gly Val Glu Leu Ala Thr Gln Ile Pro Val Tyr  
 530 535 540

Asp Lys Trp His Val Ser Ala Asn Tyr Thr Phe Thr Asp Ser Arg Arg  
 545 550 555 560

Lys Ser Asp Asp Glu Ser Leu Asn Gly Lys Ser Leu Lys Gly Glu Pro  
 565 570 575

Leu Glu Arg Thr Pro Arg His Ala Ala Asn Ala Lys Leu Glu Trp Asp  
 580 585 590

Tyr Thr Gln Asp Ile Thr Phe Tyr Ser Ser Leu Asn Tyr Thr Gly Lys  
 595 600 605

Gln Ile Trp Ala Ala Gln Arg Asn Gly Ala Lys Val Pro Arg Val Arg  
 610 615 620

Asn Gly Phe Thr Ser Met Asp Ile Gly Leu Asn Tyr Gln Ile Leu Pro  
 625 630 635 640

Asp Thr Leu Ile Asn Phe Ala Val Leu Asn Val Thr Asp Arg Lys Ser  
 645 650 655

Glu Asp Ile Asp Thr Ile Asp Gly Asn Trp Gln Val Asp Glu Gly Arg  
 660 665 670

Arg Tyr Trp Ala Asn Val Arg Val Ser Phe  
 675 680

<210> 41  
 <211> 164  
 <212> PRT  
 <213> Escherichia coli

<400> 41

Met Gly Phe Arg Lys Thr Ile Ile Thr Ser Val Gly Leu Ile Phe Ile  
1 5 10 15

Ser Phe Ser Phe Val Ala Lys Cys Ser Gln Leu Lys Asn Leu Asn Asn  
20 25 30

Tyr Ser Val Met Leu Cys Gly Lys Val Ser Asn Asn Ile Leu Asp Asp  
35 40 45

Ile Gly Gly Tyr Lys Glu Arg Asn Ile Leu Met Leu Arg Ala Ile Lys  
50 55 60

Lys Ile Ile Ile Met Thr Ile Val Asn Ile Ile Phe Phe Tyr Ser Phe  
65 70 75 80

Gln Ser Thr Ala Asp Glu Met Val Leu Ile Lys Lys Tyr Gly Phe Gly  
85 90 95

Leu Glu Arg Asp Ile Lys Gly Arg Pro Leu Ile Tyr Pro Ile Glu Asn  
100 105 110

Tyr Asp Glu Cys Lys Lys Lys Cys Asn His Met Asn Tyr Ile Ala Asp  
115 120 125

Val Asn Ala Gln Leu Ala Met Ser Lys Lys Asn Asn Arg Ile Phe Ala  
130 135 140

Asn Ile Thr Phe Thr Asn Asn Ser Ser Thr Thr Tyr Phe Phe Leu Asn  
145 150 155 160

Ile Ile Tyr Leu

<210> 42  
<211> 218  
<212> PRT  
<213> Escherichia coli

<400> 42

Met Asn Gln Ile Lys Asp Asn Lys Val Ile Met Lys Ile Lys Asn Leu  
1 5 10 15

Ile Ser Val Ile Leu Leu Ser Gly Gly Ile Met Gly Thr Gly Leu Tyr

20

25

30

Ser Ser Asp Asn His Gln Lys Ile Arg Ser Arg Phe Asn Ile Gln Glu  
 35 40 45

Ser Tyr Cys Ala Ile Lys Thr Asn Gly Val Leu Gly Phe Ser Asn Arg  
 50 55 60

Lys Asp Val Leu Arg Glu Asn Gly Asp Ser Thr Gly Thr Thr Ser Ser  
 65 70 75 80

Ser Thr Asn Ala Met Met Leu Met Glu Asn Gly Glu Asn Glu Ile Ser  
 85 90 95

Leu Glu Ile Gly Ala Leu Arg Trp Phe Ser Asp Lys Pro Ala Ser Thr  
 100 105 110

Glu Glu Arg Gly His Phe Ser Gln Lys Ala Gly Cys Ser Leu Asp Leu  
 115 120 125

Val Arg Phe Val Lys Gln Glu Glu Thr Ile Leu Ser Ser Ile Lys Val  
 130 135 140

Thr Ile Asn Gln Gln Gly Ile Pro Glu Ala Gln Pro Asp Ser Met His  
 145 150 155 160

Pro Val Ile Arg Lys Glu Ile Leu Ala Glu Gln Ala Glu Pro Gly Phe  
 165 170 175

Ile Asp Pro Asp Tyr Phe Asn Glu Thr Tyr Phe Pro Lys Gly Met Lys  
 180 185 190

Val Tyr Gln Phe Thr Gln Lys Val Ser Val Ala Gly Leu Pro Asp Gly  
 195 200 205

Pro Gly Arg Ser Thr Pro Phe Thr Gly Ala  
 210 215

<210> 43  
 <211> 2732  
 <212> PRT  
 <213> Escherichia coli

<400> 43

Met His Gln Pro Pro Val Arg Phe Thr Tyr Arg Leu Leu Ser Tyr Leu  
1 5 10 15

Val Ser Ala Ile Ile Ala Gly Gln Pro Leu Leu Pro Ala Val Gly Ala  
20 25 30

Val Ile Thr Pro Gln Asn Gly Ala Gly Met Asp Lys Ala Ala Asn Gly  
35 40 45

Val Pro Val Val Asn Ile Ala Thr Pro Asn Gly Ala Gly Ile Ser His  
50 55 60

Asn Arg Phe Thr Asp Tyr Asn Val Gly Lys Glu Gly Leu Ile Leu Asn  
65 70 75 80

Asn Ala Thr Gly Lys Leu Asn Pro Thr Gln Leu Gly Gly Leu Ile Gln  
85 90 95

Asn Asn Pro Asn Leu Lys Ala Gly Gly Glu Ala Lys Gly Ile Ile Asn  
100 105 110

Glu Val Thr Gly Gly Lys Arg Ser Leu Leu Gln Gly Tyr Thr Glu Val  
115 120 125

Ala Gly Lys Ala Ala Asn Val Met Val Ala Asn Pro Tyr Gly Ile Thr  
130 135 140

Cys Asp Gly Cys Gly Phe Ile Asn Thr Pro His Ala Thr Leu Thr Thr  
145 150 155 160

Gly Lys Pro Val Met Asn Ala Asp Gly Ser Leu Gln Ala Leu Glu Val  
165 170 175

Thr Glu Gly Ser Ile Thr Ile Asn Gly Ala Gly Leu Asp Gly Thr Arg  
180 185 190

Ser Asp Ala Val Ser Ile Ile Ala Arg Ala Thr Glu Val Asn Ala Ala  
195 200 205

Leu His Ala Lys Asp Leu Thr Val Thr Ala Gly Ala Asn Arg Val Thr  
210 215 220

Ala Asp Gly Arg Val Arg Ala Leu Lys Gly Glu Gly Asp Val Pro Lys  
225 230 235 240

Val Ala Val Asp Thr Gly Ala Leu Gly Gly Met Tyr Ala Arg Arg Ile  
245 250 255

His Leu Thr Ser Thr Glu Ser Gly Val Gly Val Asn Leu Gly Asn Leu  
260 265 270

Tyr Ala Arg Asp Gly Asp Ile Thr Leu Asp Ala Ser Gly Arg Leu Thr  
275 280 285

Val Asn Asn Ser Leu Ala Thr Gly Ala Val Thr Ala Lys Gly Gln Gly  
290 295 300

Val Thr Leu Thr Gly Asp His Lys Ala Gly Gly Asn Leu Ser Val Ser  
305 310 315 320

Ser Arg Arg Asp Ile Val Leu Ser Asn Gly Thr Leu Asn Ser Asp Lys  
325 330 335

Asp Leu Ser Leu Thr Ala Gly Gly Arg Ile Thr Gln Gln Asn Glu Lys  
340 345 350

Leu Thr Ala Gly Arg Asp Val Thr Leu Ala Ala Lys Asn Ile Thr Gln  
355 360 365

Asp Thr Ala Ser Gln Ile Asn Ala Ala Arg Asp Ile Val Thr Val Ala  
370 375 380

Ser Asp Thr Leu Thr Thr Gln Gly Gln Ile Thr Ala Gly Gln Asn Leu  
385 390 395 400

Thr Ala Ser Ala Thr Thr Leu Thr Gln Asp Gly Ile Leu Leu Ala Lys  
405 410 415

Ser His Ala Gly Leu Asn Ala Gly Thr Leu Asn Asn Ser Gly Ala Val  
420 425 430

Gln Gly Ala Thr Leu Thr Leu Gly Ser Thr Thr Leu Ser Asn Ser Gly  
435 440 445

Ser Leu Leu Ser Gly Gly Pro Leu Thr Met Asn Thr Arg Asp Phe Thr

450		455		460
Gln Ser Gly Arg Thr	Gly Ala Lys Gly Lys Val Asp Ile Met Ala Ser			
465	470	475	480	
Gly Lys Leu Thr Ser Thr Gly Leu Leu Val Thr Met His Leu Val Leu				
	485	490	495	
Lys Ala Gln Asp Val Thr Gln Asn Gly Val Leu Ser Gly Gly Lys Gly				
	500	505	510	
Leu Thr Val Ser Ala Thr Ser Ser Gly Lys Lys Ser Val Thr His Ser				
	515	520	525	
Asp Ala Ala Met Thr Leu Asn Val Thr Thr Val Ala Leu Asp Gly Glu				
	530	535	540	
Thr Ser Ala Gly Asp Thr Leu Arg Val Gln Ala Asp Lys Leu Ser Thr				
	545	550	555	560
Ala Ala Gly Ala Gln Leu Gln Ser Gly Lys Asn Leu Ser Ile Asn Ala				
	565	570	575	
Arg Asp Ala Arg Leu Ala Gly Thr Gln Ala Ala Gln Gln Thr Met Val				
	580	585	590	
Val Asn Ala Ser Glu Lys Leu Thr His Ser Gly Lys Ser Ser Ala Pro				
	595	600	605	
Ser Leu Ser Leu Ser Ala Pro Glu Leu Thr Ser Ser Gly Val Leu Val				
	610	615	620	
Gly Ser Ala Leu Asn Thr Gln Ser Gln Thr Leu Thr Asn Ser Gly Leu				
	625	630	635	640
Leu Gln Gly Glu Ala Ser Leu Thr Val Asn Thr Gln Arg Leu Asp Asn				
	645	650	655	
Gln Gln Asn Gly Thr Leu Tyr Ser Ala Ala Asp Leu Thr Leu Asp Ile				
	660	665	670	
Pro Asp Ile Arg Asn Ser Gly Leu Ile Thr Gly Asp Asn Gly Leu Met				

675

680

685

Leu Asn Ala Val Ser Leu Ser Asn Pro Gly Lys Ile Ile Ala Asp Thr  
690 695 700

Leu Ser Val Arg Ala Thr Thr Leu Asp Gly Asp Gly Leu Leu Gln Gly  
705 710 715 720

Ala Gly Ala Leu Ala Leu Ala Gly Asp Thr Leu Ser Gln Gly Ser His  
725 730 735

Gly Arg Trp Leu Thr Ala Asp Asp Leu Ser Leu Arg Gly Lys Thr Leu  
740 745 750

Asn Thr Ala Gly Thr Thr Gln Gly Gln Asn Ile Thr Val Gln Ala Asp  
755 760 765

Arg Trp Ala Asn Ser Gly Ser Val Leu Ala Thr Gly Asn Leu Thr Ala  
770 775 780

Ser Ala Thr Gly Gln Leu Thr Ser Thr Gly Asp Ile Met Ser Gln Gly  
785 790 795 800

Asp Thr Thr Leu Lys Ala Ala Thr Thr Asp Asn Arg Gly Ser Leu Leu  
805 810 815

Ser Ala Gly Thr Leu Ser Leu Asp Gly Asn Ser Leu Asp Asn Arg Gly  
820 825 830

Thr Val Gln Gly Asn His Val Thr Ile Arg Gln Asn Ser Val Thr Asn  
835 840 845

Ser Gly Thr Leu Thr Gly Ile Ala Ala Leu Thr Leu Ala Ala Arg Met  
850 855 860

Ala Ser Pro Gln Pro Ala Leu Met Asn Asn Gly Gly Ser Leu Leu Thr  
865 870 875 880

Ser Gly Asp Leu Thr Ile Thr Ala Gly Ser Ile Thr Ser Ser Gly His  
885 890 895

Trp Gln Gly Lys Arg Val Leu Ile Thr Ala Asp Ser Leu Ala Asn Ser  
900 905 910

Gly Ala Ile Gln Ala Ala Asp Ser Leu Thr Ala Arg Leu Thr Gly Glu  
 915 920 925

Leu Val Ser Thr Ala Gly Ser Lys Val Thr Ser Asn Gly Glu Met Ala  
 930 935 940

Leu Ser Ala Leu Asn Leu Ser Asn Ser Gly Gln Trp Ile Ala Lys Asn  
 945 950 955 960

Leu Thr Leu Lys Ala Asn Ser Leu Thr Ser Ala Gly Asp Ile Thr Gly  
 965 970 975

Val Asp Thr Leu Thr Leu Thr Val Asn Gln Thr Leu Asn Asn Gln Ala  
 980 985 990

Asn Gly Lys Leu Leu Ser Ala Gly Val Leu Thr Leu Lys Ala Asp Ser  
 995 1000 1005

Val Thr Asn Asp Gly Gln Leu Gln Gly Asn Val Thr Thr Ile Thr  
 1010 1015 1020

Ala Gly Gln Leu Thr Asn Gly Gly His Leu Gln Gly Glu Thr Leu  
 1025 1030 1035

Thr Leu Thr Ala Ser Gly Gly Val Asn Asn Arg Ser Gly Gly Val  
 1040 1045 1050

Leu Met Ser Arg Asn Ala Leu Asn Val Ser Thr Ala Thr Leu Ser  
 1055 1060 1065

Asn Gln Ser Thr Ile Gln Gly Gly Gly Gly Val Ser Leu Asn Ala  
 1070 1075 1080

Thr Asp Arg Leu Gln Asn Asp Gly Lys Ile Leu Ser Gly Ser Asn  
 1085 1090 1095

Leu Thr Leu Thr Ala Gln Val Leu Ala Asn Thr Gly Ser Gly Leu  
 1100 1105 1110

Val Gln Ala Ala Thr Leu Leu Leu Asp Val Val Asn Thr Val Asn  
 1115 1120 1125



Gly Gly Arg Val Leu Ala Thr Gly Ser Asp Val Lys Gly Thr Thr  
1130 1135 1140

Leu Asn Asn Thr Gly Thr Leu Gln Gly Ala Thr Leu Val Asn Tyr  
1145 1150 1155

His Thr Phe Ser Ser Gly Thr Leu Leu Gly Thr Ser Gly Leu Gly  
1160 1165 1170

Val Lys Gly Ser Ser Leu Leu Gln Asn Gly Thr Gly Arg Leu Tyr  
1175 1180 1185

Ser Ala Gly Asn Leu Leu Leu Asp Ala Gln Asp Phe Ser Gly Gln  
1190 1195 1200

Gly Gln Val Val Ala Thr Gly Asp Val Thr Leu Lys Leu Ile Ala  
1205 1210 1215

Ala Leu Thr Asn His Gly Thr Leu Ala Ala Gly Lys Thr Leu Ser  
1220 1225 1230

Val Thr Ser Gln Asn Ala Ile Thr Asn Gly Gly Val Met Gln Gly  
1235 1240 1245

Asp Ala Met Val Leu Gly Ala Gly Glu Ala Phe Thr Asn Asn Gly  
1250 1255 1260

Leu Thr Ala Gly Lys Gly Asn Ser Val Phe Ser Ala Gln Arg Leu  
1265 1270 1275

Phe Leu Asn Ala Pro Gly Ser Leu Gln Gly Gly Gly Asp Val Ser  
1280 1285 1290

Leu Asn Ser Arg Ser Asp Ile Thr Ile Ser Gly Phe Thr Gly Thr  
1295 1300 1305

Ala Gly Ser Leu Thr Met Asn Val Ala Gly Thr Leu Leu Asn Ser  
1310 1315 1320

Ala Leu Ile Tyr Ala Gly Asn Asn Leu Lys Leu Phe Thr Asp Arg  
1325 1330 1335

Leu His	Asn Gln His Gly Asp	Ile Leu Ala Gly Asn	Ser Leu Trp
1340	1345	1350	
Val Gln	Lys Asp Ala Ser Gly	Gly Ala Asn Thr Glu	Ile Ile Asn
1355	1360	1365	
Asn Ser	Gly Asn Ile Glu Thr	His Gln Gly Asp Ile	Val Val Arg
1370	1375	1380	
Thr Gly	His Leu Leu Asn Gln	Arg Glu Gly Phe Ser	Ala Thr Thr
1385	1390	1395	
Thr Thr	Arg Thr Asn Pro Ser	Ser Ile Gln Gly Met	Gly Asn Ala
1400	1405	1410	
Leu Val	Asp Ile Pro Leu Ser	Leu Leu Pro Asp Gly	Ser Tyr Gly
1415	1420	1425	
Tyr Phe	Thr Arg Glu Val Glu	Asn Gln His Gly Thr	Pro Cys Asn
1430	1435	1440	
Gly His	Gly Ala Cys Asn Ile	Thr Met Asp Thr Leu	Tyr Tyr Tyr
1445	1450	1455	
Ala Pro	Phe Ala Asp Ser Ala	Thr Gln Arg Phe Leu	Ser Ser Gln
1460	1465	1470	
Asn Ile	Thr Thr Val Thr Gly	Ala Asp Asn Pro Ala	Gly Arg Ile
1475	1480	1485	
Ala Ser	Gly Arg Asn Leu Ser	Ala Glu Ala Glu Arg	Leu Glu Asn
1490	1495	1500	
Arg Ala	Ser Phe Ile Leu Ala	Asn Gly Asp Ile Ala	Leu Ser Gly
1505	1510	1515	
Arg Glu	Leu Ser Asn Gln Ser	Trp Gln Thr Gly Thr	Glu Asn Glu
1520	1525	1530	
Tyr Leu	Val Tyr Arg Tyr Asp	Pro Lys Thr Phe Tyr	Gly Ser Tyr
1535	1540	1545	

Ala Thr Gly Ser Leu Asp Lys Leu Pro Leu Leu Ser Pro Glu Phe  
1550 1555 1560

Glu Asn Asn Thr Ile Arg Phe Ser Leu Asp Gly Arg Glu Lys Asp  
1565 1570 1575

Tyr Thr Pro Gly Lys Thr Tyr Tyr Ser Val Ile Gln Ala Gly Gly  
1580 1585 1590

Asp Val Lys Thr Arg Phe Thr Ser Ser Ile Asn Asn Gly Thr Thr  
1595 1600 1605

Thr Ala His Ala Gly Ser Val Ser Pro Val Val Ser Ala Pro Val  
1610 1615 1620

Leu Asn Thr Leu Ser Gln Gln Thr Gly Gly Asp Ser Leu Thr Gln  
1625 1630 1635

Thr Ala Leu Gln Gln Tyr Glu Pro Val Val Val Gly Ser Pro Gln  
1640 1645 1650

Trp His Asp Glu Leu Ala Gly Ala Leu Lys Asn Ile Ala Gly Gly  
1655 1660 1665

Ser Pro Leu Thr Gly Gln Thr Gly Ile Ser Asp Asp Trp Pro Leu  
1670 1675 1680

Pro Ser Gly Asn Asn Gly Tyr Leu Val Pro Ser Thr Asp Pro Asp  
1685 1690 1695

Ser Pro Tyr Leu Ile Thr Val Asn Pro Lys Leu Asp Gly Leu Gly  
1700 1705 1710

Gln Val Asp Ser His Leu Phe Ala Gly Leu Tyr Glu Leu Leu Gly  
1715 1720 1725

Ala Lys Pro Gly Gln Ala Pro Arg Glu Thr Ala Pro Ser Tyr Thr  
1730 1735 1740

Asp Glu Lys Gln Phe Leu Gly Ser Ser Tyr Phe Leu Asp Arg Leu  
1745 1750 1755

Gly Leu	Lys Pro Glu Lys Asp	Tyr Arg Phe Leu Gly	Asp Ala Val
1760		1765	1770
Phe Asp	Thr Arg Tyr Val Ser	Asn Ala Val Leu Ser	Arg Thr Gly
1775		1780	1785
Ser Arg	Tyr Leu Asn Gly Leu	Gly Ser Asp Thr Glu	Gln Met Arg
1790		1795	1800
Tyr Leu	Met Asp Asn Ala Ala	Arg Gln Gln Lys Gly	Leu Gly Leu
1805		1810	1815
Glu Phe	Gly Val Ala Leu Thr	Ala Glu Gln Ile Ala	Gln Leu Asp
1820		1825	1830
Gly Ser	Ile Leu Trp Trp Glu	Ser Val Thr Ile Asn	Gly Gln Thr
1835		1840	1845
Val Met	Val Pro Lys Leu Tyr	Leu Ser Pro Glu Asp	Ile Thr Leu
1850		1855	1860
His Asn	Gly Ser Val Ile Ser	Gly Asn Asn Val Gln	Leu Ala Gly
1865		1870	1875
Gly Asn	Ile Thr Asn Ser Gly	Gly Ser Ile Asn Ala	Gln Asn Asp
1880		1885	1890
Leu Ser	Leu Asp Ser Ser Gly	Tyr Ile Asp Asn Leu	Asn Ala Gly
1895		1900	1905
Leu Ile	Ser Ala Gly Gly Ser	Leu Asp Leu Ser Ala	Ile Gly Asp
1910		1915	1920
Ile Ser	Asn Ile Ser Ser Val	Ile Ser Gly Lys Thr	Val Gln Leu
1925		1930	1935
Glu Ser	Val Ser Gly Asn Ile	Ser Asn Ile Thr Arg	Arg Gln Gln
1940		1945	1950
Trp Asn	Ala Gly Ser Asp Ser	Gln Tyr Gly Gly Val	His Leu Ser
1955		1960	1965

Gly Thr 1970	Asp Thr Gly Pro Val 1975	Ala Thr Ile Lys Gly 1980	Thr Asp Ser
Leu Ser 1985	Leu Asp Ala Gly Lys 1990	Asn Ile Asp Ile Thr 1995	Gly Ala Thr
Val Ser 2000	Ser Gly Gly Asp Leu 2005	Gly Met Ser Ala Gly 2010	Asn Asp Ile
Asn Ile 2015	Ala Ala Asn Leu Ile 2020	Ser Gly Ser Lys Ser 2025	Gln Ser Gly
Phe Trp 2030	His Thr Asp Asp Asn 2035	Ser Ser Ser Ser Thr 2040	Thr Ser Gln
Gly Ser 2045	Ser Ile Ser Ala Gly 2050	Gly Asn Leu Ala Met 2055	Ala Ala Gly
His Asn 2060	Leu Asp Val Thr Ala 2065	Ser Ser Val Ser Ala 2070	Gly His Ser
Ala Leu 2075	Leu Ser Cys Arg Ser 2080	Arg Pro Ser Leu Glu 2085	Cys Ser Gln
Gly Lys 2090	Ala Lys Thr Ser Arg 2095	Asn Gly Arg Ser Glu 2100	Ser His Glu
Ser His 2105	Ala Ala Val Ser Thr 2110	Val Thr Ala Gly Asp 2115	Asn Phe Leu
Leu Val 2120	Ala Gly Arg Asp Ile 2125	Ala Ser Gln Ala Ala 2130	Gly Met Ala
Ala Glu 2135	Asn Asn Val Val Ile 2140	Arg Gly Gly Arg Asp 2145	Val Asn Leu
Val Ala 2150	Glu Ser Ala Gly Ala 2155	Gly Asp Ser Tyr Thr 2160	Ser Lys Lys
Lys Lys 2165	Glu Ile Asn Glu Thr 2170	Val Arg Gln Gln Gly 2175	Thr Glu Ile
Ala Ser	Gly Gly Asp Thr Thr	Val Asn Ala Gly Arg	Asp Ile Thr

2180		2185		2190
Ala Val	Ala Ser Ser Val	Thr	Ala Thr Gly Asn	Ile Ser Val Asn
2195		2200		2205
Ala Gly	Arg Asp Val Ala	Leu Thr Thr Ala Thr	Glu Ser Asp Tyr	
2210		2215		2220
His Tyr	Leu Glu Thr Lys	Lys Lys Ser Gly Gly	Phe Leu Ser Lys	
2225		2230		2235
Lys Thr	Thr Arg Thr Ile	Ser Glu Asp Ser Ala	Thr Arg Glu Ala	
2240		2245		2250
Gly Ser	Leu Leu Ser Gly	Asn Arg Val Thr Val	Asn Ala Gly Asp	
2255		2260		2265
Asn Leu	Thr Val Glu Gly	Ser Asp Val Val Ala	Asp Arg Asp Val	
2270		2275		2280
Ser Leu	Ala Ala Gly Asn	His Val Asp Val Leu	Ala Ala Thr Ser	
2285		2290		2295
Thr Asp	Thr Ser Trp Arg	Phe Lys Glu Thr Lys	Lys Ser Gly Leu	
2300		2305		2310
Met Gly	Thr Gly Gly Ile	Gly Phe Thr Ile Gly	Ser Ser Lys Thr	
2315		2320		2325
Thr His	Asp Arg Arg Glu	Ala Gly Thr Thr Gln	Ser Gln Ser Ala	
2330		2335		2340
Ser Thr	Ile Gly Ser Thr	Ala Gly Asn Val Ser	Ile Thr Ala Gly	
2345		2350		2355
Lys Gln	Ala His Ile Ser	Gly Ser Asp Val Ile	Ala Asn Arg Asp	
2360		2365		2370
Ile Ser	Ile Thr Gly Asp	Ser Val Val Val Asp	Pro Gly His Asp	
2375		2380		2385
Arg Arg	Thr Val Asp Glu	Lys Phe Glu Gln Lys	Lys Ser Gly Leu	
2390		2395		2400

Thr Val Ala Leu Ser Gly Thr Val Gly Ser Ala Ile Asn Asn Ala  
2405 2410 2415

Val Thr Ser Ala Gln Glu Thr Lys Glu Ser Ser Asp Ser Arg Leu  
2420 2425 2430

Lys Ala Leu Gln Ala Thr Lys Thr Ala Leu Ser Gly Val Gln Ala  
2435 2440 2445

Gly Gln Ala Ala Thr Met Ala Ser Ala Thr Gly Asp Pro Asn Ala  
2450 2455 2460

Gly Val Ser Leu Ser Leu Thr Thr Gln Lys Ser Lys Ser Gln Gln  
2465 2470 2475

His Ser Glu Ser Asp Thr Val Ser Gly Ser Thr Leu Asn Ala Gly  
2480 2485 2490

Asn Asn Leu Ser Val Val Ala Thr Gly Lys Asn Arg Gly Asp Asn  
2495 2500 2505

Arg Gly Asp Ile Val Ile Ala Gly Ser Gln Leu Lys Ala Gly Gly  
2510 2515 2520

Asn Thr Ser Leu Asp Ala Ala Asn Asp Ile Leu Leu Ser Gly Ala  
2525 2530 2535

Ala Asn Thr Gln Lys Thr Thr Gly Arg Asn Ser Ser Ser Gly Gly  
2540 2545 2550

Gly Val Gly Val Ser Ile Gly Ala Gly Lys Gly Ala Gly Ile Ser  
2555 2560 2565

Ala Phe Ala Ser Val Asn Ala Ala Lys Gly Arg Glu Lys Gly Asn  
2570 2575 2580

Gly Thr Thr Thr Asp Lys Thr Val Thr Ile Asn Ser Gly Arg Asp  
2585 2590 2595

Thr Val Leu Asn Gly Ala Gln Val Asn Gly Asn Arg Ile Ile Ala  
2600 2605 2610

Asp Val Gly His Asp Leu Leu Ile Ser Ser Gln Gln Asp Thr Ser

2615		2620		2625
Lys Tyr Asp Ser Lys Gln Thr Ser Val Ala Ala Gly Gly Ser Phe				
2630		2635		2640
Thr Phe Gly Ser Met Thr Gly Ser Gly Tyr Ile Ala Ala Ser Arg				
2645		2650		2655
Asp Lys Met Lys Ser Arg Phe Asp Ser Val Ala Glu Gln Thr Gly				
2660		2665		2670
Met Phe Ala Arg Val Met Val Ala Ser Thr Ser Gln Trp Val Asn				
2675		2680		2685
Ile Pro Asn Trp Met Val Arg Ser Leu Pro His Cys His Thr Gly				
2690		2695		2700
Glu Lys Pro Pro Gly Tyr Arg Thr Leu Gly Leu Val Thr Leu Gln				
2705		2710		2715
Arg Ser Gly Ile Ile Lys Ser Ser His Arg Trp Asn Gln Ser				
2720		2725		2730
<210> 44				
<211> 321				
<212> PRT				
<213> Escherichia coli				
<400> 44				
Met Met Leu Lys Lys Thr Ile Phe Ile Leu Thr Leu Phe Ser Gly Asn				
1	5	10	15	
Val Ile Ala Ala Thr Val Glu Leu Gly Phe Glu Asn Glu Gln Tyr Asn				
20	25	30		
Tyr Ala Tyr Arg Ser Ala Asp Val Phe Met Pro Tyr Ile Lys Ser Asn				
35	40	45		
Phe Asn Pro Val Thr Asp Ser Ala Leu Asn Val Ser Leu Thr Tyr Met				
50	55	60		
Tyr Gln Asp Gln Tyr Gly Lys Lys His Lys Lys Thr Ser Glu Asp Arg				
65	70	75	80	



Phe Lys Thr Asn Arg Asp Arg Ile Glu Leu Tyr Leu Lys Gly Tyr Thr  
85 90 95

Leu Asn Arg Gly Ala Tyr Ser Phe Ser Pro Ser Ala Gly Phe Arg Tyr  
100 105 110

Glu Ser Trp Asp Val Asn Tyr Asp Asn Pro Lys Lys Gln Asp Lys Trp  
115 120 125

Lys Leu Glu Leu Arg Phe Tyr Pro Asn Met Thr Tyr Lys Leu Asn Asp  
130 135 140

Gln Leu Ser Leu Tyr Met Asn Gly Phe Val Ala Pro Val Phe Phe Lys  
145 150 155 160

Thr Gln Gln Glu Ser Arg Lys Asp Asn Asn Tyr Val Lys Gly Lys Leu  
165 170 175

Gly Ala Lys Arg Tyr Asn Asn Asp Tyr Tyr Gln Glu Leu Gln Ile Leu  
180 185 190

Gly Val Arg Tyr Lys Phe Asn Asn Asp Asn Thr Leu Trp Ala Ser Val  
195 200 205

Tyr Asn Glu Arg Lys Tyr Asn Gln His Ser Ser Lys Tyr Asp Arg Trp  
210 215 220

Gln Leu Arg Gly Gly Tyr Asp Phe Lys Val Thr Glu Glu Phe Val Leu  
225 230 235 240

Ser Pro Phe Ile Arg Tyr Asp Leu Ser Tyr Arg Glu Lys Asn Leu Glu  
245 250 255

Ser Thr Ser Asn Asn Gly Leu Ser Lys Asn Asn Lys Glu Ile Arg Thr  
260 265 270

Gly Ala Ser Phe Ser Tyr Lys Ile Ile Pro Ser Val Lys Leu Val Gly  
275 280 285

Glu Ile Tyr Arg Gln Thr Thr Asn Ile Glu Asn Tyr Tyr Gly Glu His  
290 295 300

Ser Glu Asp Lys Asn Arg Met Phe Tyr Lys Leu Gly Ile Asn Lys Thr  
305 310 315 320

Phe

<210> 45  
<211> 587  
<212> PRT  
<213> Escherichia coli

<400> 45

Met Gln His Arg Gln Lys Asn Ile Leu Thr Lys Thr Ser Leu Leu Ser  
1 5 10 15

Arg Ala Leu Ser Val Pro Cys Cys Asp Met Phe Arg Arg Gly Ser Pro  
20 25 30

Trp Ile Cys Tyr Leu Ser Leu Ser Val Phe Ser Gly Cys Phe Ile Pro  
35 40 45

Ala Phe Ser Ser Pro Ala Ala Met Leu Ser Pro Gly Asp Arg Ser Ala  
50 55 60

Ile Gln Gln Gln Gln Gln Gln Leu Leu Asp Glu Asn Gln Arg Gln Arg  
65 70 75 80

Asp Ala Leu Glu Arg Pro Leu Thr Ile Thr Pro Ser Pro Glu Thr Ser  
85 90 95

Ala Gly Thr Glu Gly Pro Cys Phe Thr Val Ser Ser Ile Val Val Ser  
100 105 110

Gly Ala Thr Arg Leu Thr Ser Ala Glu Thr Asp Arg Leu Val Pro Trp  
115 120 125

Val Asn Gln Cys Leu Asn Ile Thr Gly Leu Thr Ala Val Thr Asp Ala  
130 135 140

Val Thr Asp Gly Tyr Ile Arg Arg Gly Tyr Ile Thr Ser Arg Ala Phe  
145 150 155 160

Leu Thr Glu Gln Asp Leu Ser Gly Gly Val Leu His Ile Thr Val Met  
165 170 175

Glu Gly Arg Leu Gln Gln Ile Arg Ala Glu Gly Ala Asp Leu Pro Ala  
180 185 190

Arg Thr Leu Lys Met Val Phe Pro Gly Met Glu Gly Lys Val Leu Asn  
195 200 205

Leu Arg Asp Ile Glu Gln Gly Met Glu Gln Ile Asn Arg Leu Arg Thr  
210 215 220

Glu Pro Val Gln Ile Glu Ile Ser Pro Gly Asp Arg Glu Gly Trp Ser  
225 230 235 240

Val Val Thr Leu Thr Ala Leu Pro Glu Trp Pro Val Thr Gly Ser Val  
245 250 255

Gly Ile Asp Asn Ser Gly Gln Lys Ser Thr Gly Thr Gly Gln Leu Asn  
260 265 270

Gly Val Leu Ser Phe Asn Asn Pro Leu Gly Leu Ala Asp Asn Trp Phe  
275 280 285

Val Ser Gly Gly Arg Ser Ser Asp Phe Ser Val Ser His Asp Ala Arg  
290 295 300

Asn Phe Ala Ala Gly Val Ser Leu Pro Tyr Gly Tyr Thr Leu Val Asp  
305 310 315 320

Tyr Thr Tyr Ser Trp Ser Asp Tyr Leu Ser Thr Ile Asp Asn Arg Gly  
325 330 335

Trp Arg Trp Arg Ser Thr Gly Asp Leu Gln Thr His Arg Leu Gly Leu  
340 345 350

Ser His Val Leu Phe Arg Asn Gly Asp Met Lys Thr Ala Leu Thr Gly  
355 360 365

Gly Leu Gln His Arg Ile Ile His Asn Tyr Leu Asp Asp Val Leu Leu  
370 375 380

Gln Gly Ser Ser Arg Lys Leu Thr Ser Phe Ser Val Gly Leu Asn His

385		390		395		400
Thr His Lys Phe Leu Gly Gly Val Gly Thr Leu Asn Pro Val Phe Thr						
	405			410		415
Arg Gly Met Pro Trp Phe Gly Ala Glu Ser Asp His Gly Lys Arg Gly						
	420			425		430
Asp Leu Pro Val Asn Gln Phe Arg Lys Trp Ser Val Ser Ala Ser Phe						
	435			440		445
Gln Arg Pro Val Thr Asp Arg Val Trp Trp Leu Thr Ser Ala Tyr Ala						
	450			455		460
Gln Trp Ser Pro Asp Arg Leu His Gly Val Glu Gln Leu Ser Leu Gly						
	465			470		475
Gly Glu Ser Ser Val Arg Gly Phe Lys Asp Gln Tyr Ile Ser Gly Asn						
	485			490		495
Asn Gly Gly Tyr Leu Arg Asn Glu Leu Ser Trp Ser Leu Phe Ser Leu						
	500			505		510
Pro Tyr Val Gly Thr Val Arg Ala Val Ala Ala Leu Asp Gly Gly Trp						
	515			520		525
Leu His Ser Asp Ser Asp Asp Pro Tyr Ser Ser Gly Thr Leu Trp Gly						
	530			535		540
Ala Ala Ala Gly Leu Ser Thr Thr Ser Gly His Val Ser Gly Ser Phe						
	545			550		555
Thr Ala Gly Leu Pro Leu Val Tyr Pro Asp Trp Leu Ala Pro Asp His						
	565			570		575
Leu Thr Val Tyr Trp Arg Val Ala Val Ala Phe						
	580			585		

<210> 46  
 <211> 744  
 <212> PRT  
 <213> Escherichia coli

<400> 46

Met Asn Lys His Thr Leu Leu Leu Thr Val Leu Phe Leu Asn Leu Ile  
1 5 10 15

Cys Thr Pro Val Phe Ala Gln Asn Trp Gln Val Ala Thr Phe Gly Gln  
20 25 30

Ser Thr Asp Leu Asn Phe Ser Ser Leu Ile Asp Ser Ala Lys Ile Gly  
35 40 45

Arg Asn Asn Ala Trp Leu Ala Gly Asn Asn Asn Phe Leu Glu Ala Gly  
50 55 60

Lys Phe Tyr Thr Leu Pro Thr Asp Phe Phe Ile Glu Ser Arg Gly Gly  
65 70 75 80

Lys Ile Ala Asn Ser His Asp Gly Met Thr Val Phe Tyr Thr Ile Val  
85 90 95

Pro Val Thr Gln Thr Phe Arg Leu Glu Ala Asp Leu Thr Leu Glu Gln  
100 105 110

Ile Gly Pro Glu Val Asn Gly Lys Ser Pro Ala Gly Gln Glu Gly Ala  
115 120 125

Gly Leu Phe Val Arg Asp Ile Ile Gly Pro Gln Arg Gln Glu Pro Gln  
130 135 140

Ser Ala Gly Thr Glu Glu Tyr Pro Gln Ala Ser Asn Ile Leu Met Asn  
145 150 155 160

Ala Phe Ile Thr Gln Asn Lys Lys Asn Asp Asn Leu Val Gln Ile Thr  
165 170 175

Ser Ile Val Arg Glu Gly Val Ile Lys Thr Trp Gly Asn Glu Gly Ile  
180 185 190

Thr Ile Lys Lys Gln Pro Ile Ile Glu Asn Ile Asn Phe Thr Gln Lys  
195 200 205

Arg Asn Ile His Met Thr Ile Glu Arg Leu Pro Glu Lys Phe Ile Leu  
210 215 220

Thr Ala Phe Asp Thr Asp Arg Lys Glu Asn Gln Ser Trp Gln Phe Ser  
225 230 235 240

Asp Tyr Ser Gly Phe Met Asn Gln Leu Asp Asn Asn Ser Leu Ala Ile  
245 250 255

Gly Phe Phe Ala Ala Arg Asn Ala Lys Leu Arg Val Lys Asn Ala Ser  
260 265 270

Phe Lys Pro Gly Lys Pro Leu Val Asp Tyr Lys Gln Leu Thr Ser Arg  
275 280 285

Gln Phe Ser Arg Val Arg His Lys Ala Pro Glu Leu Phe Leu Ala Ser  
290 295 300

Pro Gln Ser Val Val Arg Asn Ser Thr Thr Leu Gln Phe Leu Ala Asn  
305 310 315 320

Gln Ala Gly Ile Val Ser Ile Asp Asn Asp Lys Gln Thr Lys Gln Val  
325 330 335

Gln Ala Gly Glu Leu Val Gln Phe Pro Val Thr Leu Gln Lys Lys His  
340 345 350

Asn Asp Phe Thr Val Asn Phe Asn Val Asp Gly Asn Ile Ser Lys Lys  
355 360 365

Ala Ile Arg Ile Glu Gln Val Lys Ser Asn Leu Thr Asp Pro Tyr Glu  
370 375 380

Ile Tyr Val Cys Ser Asp Cys Arg Gln Gly Ala Arg Gly Ser Lys Asn  
385 390 395 400

Asp Pro Val Asp Leu Gln Thr Ala Val Lys Phe Val Ala Pro Gly Gly  
405 410 415

Asn Ile Tyr Leu Asn Asp Gly Gln Tyr His Gly Ile Thr Leu Asp Arg  
420 425 430

Glu Leu Ser Gly Ile Pro Gly Lys Tyr Lys Thr Ile Ser Ala Ile Asn  
435 440 445

Pro His Lys Ala Ile Phe Ile Asn Lys Thr Phe Asn Leu Asp Ala Ser  
450 455 460

Tyr Trp His Leu Lys Ser Val Val Phe Asp Gly Asn Val Asp Asn Gly  
465 470 475 480

Asn Asn Lys Pro Ala Tyr Leu Arg Ile Ala Gly Ser Tyr Asn Ile Ile  
485 490 495

Glu His Val Ile Ala Arg Asn Asn Asp Asp Thr Gly Ile Ser Ile Ser  
500 505 510

Ala Lys Asp Lys Asn Arg Phe Phe Trp Pro Ala His Asn Leu Val Leu  
515 520 525

Asn Ser Asp Ser Tyr Asn Asn Leu Asp Leu Ser Gly Ile Asn Ala Asp  
530 535 540

Gly Phe Ala Ala Lys Leu Gly Val Gly Pro Gly Asn Ile Phe Arg Gly  
545 550 555 560

Cys Ile Ala His Asn Asn Ala Asp Asp Gly Trp Asp Leu Phe Asn Lys  
565 570 575

Ile Glu Asp Gly Pro Asn Ala Ser Val Thr Ile Glu Asn Ser Val Ala  
580 585 590

Tyr Glu Asn Gly Leu Pro Tyr Asn Lys Ala Asp Ile Leu Lys Gly Ser  
595 600 605

Ile Gly Asn Gly Gly Glu Gly Gln Pro Ser Lys Ser Gln Val Ile Asn  
610 615 620

Ser Ile Ala Ile Asn Asn Asn Met Asp Gly Phe Thr Asp Asn Phe Asn  
625 630 635 640

Thr Gly Ser Leu Ile Val Arg Asn Asn Ile Ala Met Asn Asn Ala Arg  
645 650 655

Tyr Asn Tyr Ile Leu Arg Thr Asn Pro Tyr Lys Phe Pro Ser Ser Ile  
660 665 670

Leu Phe Asp Asn Asn Tyr Ser Ile Arg Asp Asp Trp Glu Asn Lys Ile  
675 680 685

Lys Asp Phe Leu Gly Asp Thr Val Asn Ser Val Asn Tyr Lys Leu Leu  
690 695 700

Val Ser His Glu Thr Gly Pro Val Gln Lys Asp Leu Phe Phe Thr Arg  
705 710 715 720

Asp Asp Ser Gly Asn Ile Ile Tyr Pro Asp Phe Phe Leu Asn Ile Ile  
725 730 735

Asn Lys Phe Asn Glx Thr Met Pro  
740

<210> 47  
<211> 136  
<212> FRT  
<213> Escherichia coli

<400> 47

Met Lys Thr Phe Ile Lys Thr Leu Leu Val Ala Val Thr Ile Leu Phe  
1 5 10 15

Ser Val Phe Ala Thr Ala Lys Gln Val Lys Leu Pro Asn Asn Ile Lys  
20 25 30

Tyr Val Asn Thr Thr Glu Ala Phe Ser Cys Thr Glu Ile Asp Gly Met  
35 40 45

Asn Cys Gln Thr Lys Asn Pro Phe Asn Tyr Lys Asp Asn Ser Tyr Val  
50 55 60

Phe Val Leu Glu Arg Gly Gly Ala Trp Cys Tyr Asp Tyr Thr Val Ser  
65 70 75 80

Val Leu Asn Leu Lys Thr Gly Lys Ala Gln Met Leu Glu Tyr Lys Asp  
85 90 95

Asn Gln Leu Cys Ser Gly Ser Asn Lys Pro Phe Phe Glu Ile Lys Asn  
100 105 110

Gly Val Pro Thr Val Gly Val Ile Asp Thr Ser Gly Lys Pro Val Val  
115 120 125



Val Ala Leu Asp Lys Leu Lys Thr  
130 135

<210> 48  
<211> 225  
<212> PRT  
<213> Escherichia coli

<400> 48

Met Gln Leu Pro Val Lys Leu Leu Met Ser Leu Ile Ser Leu Val Ser  
1 5 10 15

Val Ile Ala Arg Ala Gly Lys Tyr Lys Asn Tyr Ile Arg Asp Glu Ile  
20 25 30

Lys Tyr Trp Arg Tyr Thr Ser Tyr Lys Gly Gly Glu Phe Pro Glu Gly  
35 40 45

Phe Thr Asp Glu Lys Phe Ser Ser Ala Ile Tyr Asn Gly Arg Ile Phe  
50 55 60

Thr Met Lys Arg Leu His Thr Leu Met Leu Phe Leu Ala Val Leu Phe  
65 70 75 80

Thr Gly Phe Asn Val Glu Ala Ala Ser Val Lys Gln Ala Leu Ser Cys  
85 90 95

Asp Pro Asn Ala Arg Ala Glu Gln Pro Gly Ala Cys Pro Thr Thr Tyr  
100 105 110

Glu Leu Tyr Glu Gly Asp Ala Ala Tyr Lys Ala Ala Leu Asp Lys Ala  
115 120 125

Leu Lys Pro Val Gly Leu Ser Gly Met Phe Gly Lys Gly Gly Tyr Met  
130 135 140

Asp Gly Pro Gly Gly Asn Val Thr Pro Val Thr Ile Asn Gly Thr Val  
145 150 155 160

Trp Leu Gln Gly Asp Gly Cys Lys Ala Asn Thr Cys Gly Trp Asp Phe  
165 170 175

Ile Val Thr Leu Tyr Asn Pro Lys Thr His Glu Val Val Gly Tyr Arg  
180 185 190

Tyr Phe Gly Leu Asp Asp Pro Ala Tyr Leu Val Trp Phe Gly Glu Ile  
195 200 205

Gly Val His Glu Phe Ala Tyr Leu Val Lys Asn Tyr Val Ala Ala Val  
210 215 220

Asn  
225

<210> 49  
<211> 721  
<212> PRT  
<213> Escherichia coli

<400> 49

Met Lys Thr Gln Ile Thr Phe Ala Ala Leu Leu Pro Ala Leu Ala Ser  
1 5 10 15

Phe Ile Pro Leu His Ala His Ala Ser Ser Thr Ser Glu Asp Glu Met  
20 25 30

Ile Val Thr Gly Asn Thr Ala Ala Asp Thr Thr Asp Ser Ala Ala Gly  
35 40 45

Ala Gly Phe Lys Thr Asn Asp Ile Asp Val Gly Pro Leu Gly Thr Lys  
50 55 60

Ser Trp Ile Glu Thr Pro Tyr Ser Ser Thr Thr Val Thr Lys Glu Met  
65 70 75 80

Ile Glu Asn Gln Gln Ala Gln Ser Val Ser Glu Met Leu Lys Tyr Ser  
85 90 95

Pro Ser Thr Gln Met Gln Ala Arg Gly Gly Met Asp Val Gly Arg Pro  
100 105 110

Gln Ser Arg Gly Met Gln Gly Ser Val Val Ala Asn Ser Arg Leu Asp  
115 120 125

Gly Leu Asn Ile Val Ser Thr Thr Ala Phe Pro Val Glu Met Leu Glu  
130 135 140

Arg Met Asp Val Leu Asn Ser Leu Thr Gly Ala Leu Tyr Gly Pro Ala  
145 150 155 160

Ser Pro Ala Gly Gln Phe Asn Phe Val Ala Lys Arg Pro Thr Glu Glu  
165 170 175

Thr Leu Arg Lys Val Thr Leu Gly Tyr Gln Ser Arg Ser Ala Phe Thr  
180 185 190

Gly His Ala Asp Leu Gly Gly His Phe Asp Glu Asn Lys Arg Phe Gly  
195 200 205

Tyr Arg Val Asn Leu Leu Asp Gln Glu Gly Glu Gly Asn Val Asp Asp  
210 215 220

Ser Thr Leu Arg Arg Lys Leu Val Ser Val Ala Leu Asp Trp Asn Ile  
225 230 235 240

Gln Pro Gly Thr Gln Leu Gln Leu Asp Ala Ser His Tyr Glu Phe Ile  
245 250 255

Gln Lys Gly Tyr Val Gly Ser Phe Asn Tyr Gly Pro Asn Val Lys Leu  
260 265 270

Pro Ser Ala Pro Asn Pro Lys Asp Lys Asn Leu Ala Leu Ser Thr Ala  
275 280 285

Gly Asn Asp Leu Thr Thr Asp Thr Ile Ser Thr Arg Leu Ile His Tyr  
290 295 300

Phe Asn Asp Asp Trp Ser Met Asn Ala Gly Val Gly Trp Gln Gln Ala  
305 310 315 320

Asp Arg Ala Met Arg Ser Val Ser Ser Lys Ile Leu Asn Asn Gln Gly  
325 330 335

Asp Ile Ser Arg Ser Met Lys Asp Ser Thr Ala Ala Gly Arg Phe Arg  
340 345 350

Val Leu Ser Asn Thr Ala Gly Leu Asn Gly His Ile Asp Thr Gly Ser  
355 360 365

Ile Gly His Asp Leu Ser Leu Ser Thr Thr Gly Tyr Val Trp Ser Leu  
370 375 380

Tyr Ser Ala Lys Gly Thr Gly Ser Ser Tyr Ser Trp Gly Thr Thr Asn  
385 390 395 400

Met Tyr His Pro Asp Ala Ile Asp Glu Gln Gly Asp Gly Lys Ile Arg  
405 410 415

Thr Gly Gly Pro Arg Tyr Arg Ser Ser Val Asn Thr Gln Gln Ser Val  
420 425 430

Thr Leu Gly Asp Thr Val Thr Phe Thr Pro Gln Trp Ser Ala Met Phe  
435 440 445

Tyr Leu Ser Gln Ser Trp Leu Gln Thr Lys Asn Tyr Asp Lys His Gly  
450 455 460

Asn Gln Thr Asn Gln Val Asp Glu Asn Gly Leu Ser Pro Asn Ala Ala  
465 470 475 480

Leu Met Tyr Lys Ile Thr Pro Asn Thr Met Ala Tyr Val Ser Tyr Ala  
485 490 495

Asp Ser Leu Glu Gln Gly Gly Thr Ala Pro Thr Asp Glu Ser Val Lys  
500 505 510

Asn Ala Gly Gln Thr Leu Asn Pro Tyr Arg Ser Lys Gln Tyr Glu Val  
515 520 525

Gly Leu Lys Ser Asp Ile Gly Glu Met Asn Leu Gly Ala Ala Leu Phe  
530 535 540

Arg Leu Glu Arg Pro Phe Ala Tyr Leu Asp Thr Asp Asn Val Tyr Lys  
545 550 555 560

Glu Gln Gly Asn Gln Val Asn Asn Gly Leu Glu Leu Thr Ala Ala Gly  
565 570 575

Asn Val Trp Gln Gly Leu Asn Ile Tyr Ser Gly Val Thr Phe Leu Asp  
580 585 590

Pro Lys Leu Lys Asp Thr Ala Asn Ala Ser Thr Ser Asn Lys Gln Val  
595 600 605

Val Gly Val Pro Lys Val Gln Ala Asn Leu Leu Ala Glu Tyr Ser Leu  
610 615 620

Pro Ser Ile Pro Glu Trp Val Tyr Ser Ala Asn Val His Tyr Thr Gly  
625 630 635 640

Lys Arg Ala Ala Asn Asp Thr Asn Thr Ser Tyr Ala Ser Ser Tyr Thr  
645 650 655

Thr Trp Asp Leu Gly Thr Arg Tyr Thr Thr Lys Val Ser Asn Val Pro  
660 665 670

Thr Thr Phe Arg Val Val Val Asn Asn Val Phe Asp Lys His Tyr Trp  
675 680 685

Ala Ser Ile Phe Pro Ser Gly Thr Asp Gly Asp Asn Gly Ser Pro Ser  
690 695 700

Ala Phe Ile Gly Gly Gly Arg Glu Val Arg Ala Ser Val Thr Phe Asp  
705 710 715 720

Phe

<210> 50  
<211> 669  
<212> PRT  
<213> Escherichia coli

<400> 50

Met Lys Asn Ile Thr Leu Trp Gln Arg Leu Arg Gln Val Ser Ile Ser  
1 5 10 15

Thr Ser Leu Arg Cys Ala Phe Leu Met Gly Ala Leu Leu Thr Leu Ile  
20 25 30

Val Ser Ser Val Ser Leu Tyr Ser Trp His Glu Gln Ser Ser Gln Ile  
35 40 45

Arg Tyr Ser Leu Asp Lys Tyr Phe Pro Arg Ile His Ser Ala Phe Leu

50

55

60

Ile Glu Gly Asn Leu Asn Leu Val Val Asp Gln Leu Asn Glu Phe Leu  
65 70 75 80

Gln Ala Pro Asn Thr Thr Val Arg Leu Gln Leu Arg Thr Gln Ile Ile  
85 90 95

Gln His Leu Asp Thr Ile Glu Arg Leu Ser Arg Gly Leu Ser Ser Arg  
100 105 110

Glu Arg Gln Gln Leu Thr Val Ile Leu Gln Asp Ser Arg Ser Leu Leu  
115 120 125

Ser Glu Leu Asp Arg Ala Leu Tyr Asn Met Phe Leu Leu Arg Glu Lys  
130 135 140

Val Ser Glu Leu Ser Ala Arg Ile Asp Trp Leu His Asp Asp Phe Thr  
145 150 155 160

Thr Glu Leu Asn Ser Leu Val Gln Asp Phe Thr Trp Gln Gln Gly Thr  
165 170 175

Leu Leu Asp Gln Ile Ala Ser Arg Gln Gly Asp Thr Ala Gln Tyr Leu  
180 185 190

Lys Arg Ser Arg Glu Val Gln Asn Glu Gln Gln Val Tyr Thr Leu  
195 200 205

Ala Arg Ile Glu Asn Gln Ile Val Asp Asp Leu Arg Asp Arg Leu Asn  
210 215 220

Glu Leu Lys Ser Gly Arg Asp Asp Asp Ile Gln Val Glu Thr His Leu  
225 230 235 240

Arg Tyr Phe Glu Asn Leu Lys Lys Thr Ala Asp Glu Asn Ile Arg Met  
245 250 255

Leu Asp Asp Trp Pro Gly Thr Ile Thr Leu Arg Gln Thr Ile Asp Glu  
260 265 270

Leu Leu Asp Met Gly Ile Val Lys Asn Lys Met Pro Asp Thr Met Arg  
275 280 285

Glu Tyr Val Ala Ala Gln Lys Ala Leu Glu Asp Ala Ser Arg Thr Arg  
290 295 300

Glu Ala Thr Gln Gly Arg Phe Arg Thr Leu Leu Glu Ala Gln Leu Gly  
305 310 315 320

Ser Thr His Gln Gln Met Gln Met Phe Asn Gln Arg Met Glu Gln Ile  
325 330 335

Val His Val Ser Gly Gly Leu Ile Leu Val Ala Thr Ala Leu Ala Leu  
340 345 350

Leu Leu Ala Trp Val Phe Asn His Tyr Phe Ile Arg Ser Arg Leu Val  
355 360 365

Lys Arg Phe Thr Leu Leu Asn Gln Ala Val Val Gln Ile Gly Leu Gly  
370 375 380

Gly Thr Glu Thr Thr Ile Pro Val Tyr Gly Asn Asp Glu Leu Gly Arg  
385 390 395 400

Ile Ala Gly Leu Leu Arg His Thr Leu Gly Gln Leu Asn Val Gln Lys  
405 410 415

Gln Gln Leu Glu Gln Glu Ile Thr Asp Arg Lys Val Ile Glu Ala Asp  
420 425 430

Leu Arg Ala Thr Gln Asp Glu Leu Ile Gln Thr Ala Lys Leu Ala Val  
435 440 445

Val Gly Gln Thr Met Thr Thr Leu Ala His Glu Ile Asn Gln Pro Leu  
450 455 460

Asn Ala Leu Ser Met Tyr Leu Phe Thr Ala Arg Arg Ala Ile Glu Gln  
465 470 475 480

Thr Gln Lys Glu Gln Ala Ser Met Met Leu Gly Lys Ala Glu Gly Val  
485 490 495

Ile Ser Arg Ile Asp Ala Ile Ile Arg Ser Leu Arg Gln Phe Thr Arg  
500 505 510

Arg Ala Glu Leu Glu Thr Ser Leu His Ala Val Asp Leu Ala Gln Met  
515 520 525

Phe Ser Ala Ala Trp Glu Leu Leu Ala Met Arg His Arg Ser Leu Gln  
530 535 540

Ala Thr Leu Val Leu Pro Gln Gly Thr Ala Thr Val Ser Gly Asp Glu  
545 550 555 560

Val Arg Thr Gln Gln Val Leu Val Asn Val Leu Ala Asn Ala Leu Asp  
565 570 575

Val Cys Gly Gln Gly Ala Val Ile Thr Val Asn Trp Gln Met Gln Gly  
580 585 590

Lys Thr Leu Asn Val Phe Ile Gly Asp Asn Gly Pro Gly Trp Pro Glu  
595 600 605

Ala Leu Leu Pro Ser Leu Leu Lys Pro Phe Thr Thr Ser Lys Glu Val  
610 615 620

Gly Leu Gly Ile Gly Leu Ser Ile Cys Val Ser Leu Met Glu Gln Met  
625 630 635 640

Lys Gly Glu Leu Arg Leu Ala Ser Thr Met Thr Arg Asn Ala Cys Val  
645 650 655

Val Leu Gln Phe Arg Leu Thr Asp Val Glu Asp Ala Lys  
660 665

<210> 51  
<211> 753  
<212> PRT  
<213> Escherichia coli

<400> 51

Met Asn Val Ile Lys Leu Ala Ile Gly Ser Gly Ile Leu Leu Leu Ser  
1 5 10 15

Cys Gly Ala Tyr Ser Gln Ser Ile Ser Glu Lys Thr Asn Ser Asp Lys  
20 25 30

Lys Gly Ala Ala Glu Phe Ser Pro Leu Ser Val Ser Val Gly Lys Thr



35

40

45

Thr Ser Glu Gln Glu Ala Leu Glu Lys Thr Gly Ala Thr Ser Ser Arg  
50 55 60

Thr Thr Asp Lys Asn Leu Gln Ser Leu Asp Ala Thr Val Arg Ser Met  
65 70 75 80

Pro Gly Thr Tyr Thr Gln Ile Asp Pro Gly Gln Gly Ala Ile Ser Val  
85 90 95

Asn Ile Arg Gly Met Ser Gly Phe Gly Arg Val Asn Thr Met Val Asp  
100 105 110

Gly Ile Thr Gln Ser Phe Tyr Gly Thr Ser Thr Ser Gly Thr Thr Thr  
115 120 125

His Gly Ser Thr Asn Asn Met Ala Gly Val Leu Ile Asp Pro Asn Leu  
130 135 140

Leu Val Ala Val Asp Val Thr Arg Gly Asp Ser Ser Gly Ser Glu Gly  
145 150 155 160

Ile Asn Ala Leu Ala Gly Ser Ala Asn Met Arg Thr Ile Gly Val Asp  
165 170 175

Asp Val Ile Phe Asn Gly Asn Thr Tyr Gly Leu Arg Ser Arg Phe Ser  
180 185 190

Val Gly Ser Asn Gly Leu Gly Arg Ser Gly Met Ile Ala Leu Gly Gly  
195 200 205

Lys Ser Asp Ala Phe Thr Asp Thr Gly Ser Ile Gly Val Met Ala Ala  
210 215 220

Val Ser Gly Ser Ser Val Tyr Ser Asn Phe Ser Asn Gly Ser Gly Ile  
225 230 235 240

Asn Ser Lys Glu Phe Gly Tyr Asp Lys Tyr Met Lys Gln Asn Pro Lys  
245 250 255

Ser Gln Leu Tyr Lys Met Asp Ile Arg Pro Asp Glu Phe Asn Ser Phe  
260 265 270

Glu Leu Ser Ala Arg Thr Tyr Glu Asn Lys Phe Thr Arg Arg Asp Ile  
275 280 285

Thr Ser Asp Asp Tyr Tyr Ile Lys Tyr His Tyr Thr Pro Phe Ser Glu  
290 295 300

Leu Ile Asp Phe Asn Val Thr Ala Ser Thr Ser Arg Gly Asn Gln Lys  
305 310 315 320

Tyr Arg Asp Gly Ser Leu Tyr Thr Phe Tyr Lys Thr Ser Ala Gln Asn  
325 330 335

Arg Ser Asp Ala Leu Asp Ile Asn Asn Thr Ser Arg Phe Thr Val Ala  
340 345 350

Asp Asn Asp Leu Glu Phe Met Leu Gly Ser Lys Leu Met Arg Thr Arg  
355 360 365

Tyr Asp Arg Thr Ile His Ser Ala Ala Gly Asp Pro Lys Ala Asn Gln  
370 375 380

Glu Ser Ile Glu Asn Asn Pro Phe Ala Pro Ser Gly Gln Gln Asp Ile  
385 390 395 400

Ser Ala Leu Tyr Thr Gly Leu Lys Val Thr Arg Gly Ile Trp Glu Ala  
405 410 415

Asp Phe Asn Leu Asn Tyr Thr Arg Asn Arg Ile Thr Gly Tyr Lys Pro  
420 425 430

Ala Cys Asp Ser Arg Val Ile Cys Val Pro Gln Gly Ser Tyr Asp Ile  
435 440 445

Asp Asp Lys Glu Gly Gly Phe Asn Pro Ser Val Gln Leu Ser Ala Gln  
450 455 460

Val Thr Pro Trp Leu Gln Pro Phe Ile Gly Tyr Ser Lys Ser Met Arg  
465 470 475 480

Ala Pro Asn Ile Gln Glu Met Phe Phe Ser Asn Ser Gly Gly Ala Ser  
485 490 495

Met Asn Pro Phe Leu Lys Pro Glu Arg Ala Glu Thr Trp Gln Ala Gly

500

505

510

Phe Asn Ile Asp Thr Arg Asp Leu Leu Val Glu Gln Asp Ala Leu Arg  
 515 520 525

Phe Lys Ala Leu Ala Tyr Arg Ser Arg Ile Gln Asn Tyr Ile Tyr Ser  
 530 535 540

Glu Ser Tyr Leu Val Cys Ser Gly Gly Arg Lys Cys Ser Leu Pro Glu  
 545 550 555 560

Val Ile Gly Asn Gly Trp Glu Gly Ile Ser Asp Glu Tyr Ser Asp Asn  
 565 570 575

Met Tyr Ile Tyr Val Asn Ser Ala Ser Asp Val Ile Ala Lys Gly Phe  
 580 585 590

Glu Leu Glu Met Asp Tyr Asp Ala Gly Phe Ala Phe Gly Arg Leu Ser  
 595 600 605

Phe Ser Gln Gln Gln Thr Asp Gln Pro Thr Ser Ile Ala Ser Thr His  
 610 615 620

Phe Gly Ala Gly Asp Ile Thr Glu Leu Pro Arg Lys Tyr Met Thr Leu  
 625 630 635 640

Asp Thr Gly Val Arg Phe Phe Asp Asn Ala Leu Thr Leu Gly Thr Ile  
 645 650 655

Ile Lys Tyr Thr Gly Lys Ala Arg Arg Leu Ser Pro Asp Phe Glu Gln  
 660 665 670

Asp Glu His Thr Gly Ala Ile Ile Lys Gln Asp Leu Pro Gln Ile Pro  
 675 680 685

Thr Ile Ile Asp Leu Tyr Gly Thr Tyr Glu Tyr Asn Arg Asn Leu Thr  
 690 695 700

Leu Lys Leu Ser Val Gln Asn Leu Met Asn Arg Asp Tyr Ser Glu Ala  
 705 710 715 720

Leu Asn Lys Leu Asn Met Met Pro Gly Leu Gly Asp Glu Thr His Pro

725

730

735

Ala Asn Ser Ala Arg Gly Arg Thr Trp Ile Phe Gly Gly Asp Ile Arg  
 740 745 750

Phe

<210> 52  
 <211> 133  
 <212> PRT  
 <213> Escherichia coli

&lt;400&gt; 52

Met Ser Ser Lys Thr Lys Cys Trp Leu Trp Met Leu Leu Val Ile Leu  
 1 5 10 15

Ser Glu Thr Ser Ala Thr Ser Thr Leu Lys Met Phe Asp Asn Ser Glu  
 20 25 30

Gly Met Thr Lys Thr Leu Leu Leu Ala Leu Ile Val Val Leu Tyr Cys  
 35 40 45

Ile Cys Tyr Tyr Ser Leu Ser Arg Ala Val Lys Asp Ile Pro Val Gly  
 50 55 60

Leu Ala Tyr Ala Thr Trp Ser Gly Thr Gly Ile Leu Met Val Ser Thr  
 65 70 75 80

Leu Gly Ile Leu Phe Tyr Gly Gln His Pro Asp Thr Ala Ala Ile Ile  
 85 90 95

Gly Met Val Ile Ile Ala Ser Gly Ile Ile Ile Met Asn Leu Phe Ser  
 100 105 110

Lys Met Gly Ser Glu Glu Ala Glu Glu Thr Pro Val Thr Asn Leu Asp  
 115 120 125

Lys Lys Ile Ala Asn  
 130

<210> 53  
 <211> 286  
 <212> PRT

<213> Escherichia coli

<400> 53

Met Tyr Ile Lys Lys His Trp Ile Ala Leu Ser Ile Leu Leu Ile Pro  
1 5 10 15

Cys Ile Gly Asn Ala Gln Glu Ile Lys Ile Asp Glu Ser Trp Leu His  
20 25 30

Gln Ser Leu Asn Val Ile Gly Arg Thr Asp Ser Arg Phe Gly Pro Arg  
35 40 45

Leu Thr Asn Asp Leu Tyr Pro Glu Tyr Thr Val Ala Gly Arg Lys Asp  
50 55 60

Trp Phe Asp Phe Tyr Gly Tyr Val Asp Leu Pro Lys Phe Phe Gly Val  
65 70 75 80

Gly Ser His Tyr Asp Val Gly Ile Trp Asp Glu Gly Ser Pro Leu Phe  
85 90 95

Thr Glu Ile Glu Pro Arg Phe Ser Ile Asp Lys Leu Thr Gly Leu Asn  
100 105 110

Leu Ala Phe Gly Pro Phe Lys Glu Trp Phe Ile Ala Asn Asn Tyr Val  
115 120 125

Tyr Asp Met Gly Asp Asn Gln Ser Ser Arg Gln Ser Thr Trp Tyr Met  
130 135 140

Gly Leu Gly Thr Asp Ile Asp Thr Gly Leu Pro Ile Lys Leu Ser Ala  
145 150 155 160

Asn Ile Tyr Ala Lys Tyr Gln Trp Gln Asn Tyr Gly Ala Ala Asn Glu  
165 170 175

Asn Glu Trp Asp Gly Tyr Arg Phe Lys Ile Lys Tyr Ser Ile Pro Leu  
180 185 190

Thr Asn Leu Phe Gly Gly Arg Leu Val Tyr Asn Ser Phe Thr Asn Phe  
195 200 205

Asp Phe Gly Ser Asp Leu Ala Asp Lys Ser His Asn Asn Lys Arg Thr

210

215

220

Ser Asn Ala Ile Ala Ser Ser His Ile Leu Ser Leu Leu Tyr Glu His  
 225 230 235 240

Trp Lys Phe Ala Phe Thr Leu Arg Tyr Phe His Asn Gly Gly Gln Trp  
 245 250 255

Asn Ala Gly Glu Lys Val Asn Phe Gly Asp Gly Pro Phe Glu Leu Lys  
 260 265 270

Asn Thr Gly Trp Gly Thr Tyr Thr Thr Ile Gly Tyr Gln Phe  
 275 280 285

<210> 54  
 <211> 172  
 <212> PRT  
 <213> Escherichia coli

<400> 54

Met Arg Ile Ala Pro Arg Thr Phe Phe Ala Ile Ser Ala Leu Ala Phe  
 1 5 10 15

Ile Val Ala Ser Gly Phe Ser Phe Trp Arg Leu Ser Pro Ala Glu Asn  
 20 25 30

Thr Gly Ile Met Ser Cys Ser Thr Lys Gly Ile Met Arg Phe Glu Asn  
 35 40 45

Met Glu Lys Glu Asn Val Asn Gly Asn Ile His Phe Asn Phe Gly Ser  
 50 55 60

Gln Gly Lys Gly Ser Met Val Leu Glu Gly Tyr Thr Asp Ser Ala Ala  
 65 70 75 80

Gly Trp Leu Tyr Leu Gln Arg Tyr Val Lys Phe Thr Tyr Thr Ser Lys  
 85 90 95

Arg Val Ser Ala Thr Glu Arg His Tyr Arg Ile Ser Gln Trp Glu Ser  
 100 105 110

Ser Ala Ser Ser Ile Asp Glu Ser Pro Asp Val Ile Phe Asp Tyr Phe  
 115 120 125

Met Arg Glu Met Ser Asp Ser His Asp Gly Leu Phe Leu Asn Ala Gln  
130 135 140

Lys Leu Asn Asp Lys Ala Ile Leu Leu Ser Ser Ile Asn Ser Pro Leu  
145 150 155 160

Trp Ile Cys Thr Leu Lys Ser Gly Ser Lys Leu Asp  
165 170

<210> 55  
<211> 182  
<212> PRT  
<213> Escherichia coli

<400> 55

Met Lys Ile Lys Val Ile Ala Leu Ala Thr Phe Val Ser Ala Val Phe  
1 5 10 15

Ala Gly Ser Ala Met Ala Tyr Asp Gly Thr Ile Thr Phe Thr Gly Lys  
20 25 30

Val Val Ala Gln Thr Cys Thr Val Asn Thr Ser Asp Lys Asp Leu Ala  
35 40 45

Val Thr Leu Pro Thr Val Ala Thr Ser Ser Leu Lys Asp Asn Ala Ala  
50 55 60

Thr Ser Gly Leu Thr Pro Phe Ala Ile Arg Leu Thr Gly Cys Ala Thr  
65 70 75 80

Gly Met Asn Ser Ala Gln Asn Val Lys Ala Tyr Phe Glu Pro Ser Ser  
85 90 95

Asn Ile Asp Leu Ala Thr His Asn Leu Lys Asn Thr Ala Thr Pro Thr  
100 105 110

Lys Ala Asp Asn Val Gln Ile Gln Leu Leu Asn Ser Asn Gly Thr Ser  
115 120 125

Thr Ile Leu Leu Gly Glu Ala Asp Asn Gly Gln Asp Val Gln Ser Glu  
130 135 140

Thr Ile Gly Ser Asp Gly Ser Ala Thr Leu Arg Tyr Met Ala Gln Tyr  
145 150 155 160

Tyr Ala Thr Gly Gln Ser Thr Ala Gly Asp Val Lys Ala Thr Val His  
165 170 175

Tyr Thr Ile Ala Tyr Glu  
180

<210> 56  
<211> 359  
<212> PRT  
<213> Escherichia coli

<400> 56

Met Lys Arg Ile Phe Phe Ile Pro Leu Phe Leu Ile Leu Leu Pro Lys  
1 5 10 15

Leu Ala Val Ala Gly Pro Asp Asp Tyr Val Pro Ser Gln Ile Ala Val  
20 25 30

Asn Thr Ser Thr Leu Pro Gly Val Val Ile Gly Pro Ala Asp Ala His  
35 40 45

Thr Tyr Pro Arg Val Ile Gly Glu Leu Ala Gly Thr Ser Asn Gln Tyr  
50 55 60

Val Phe Asn Gly Gly Ala Ile Ala Leu Met Arg Gly Lys Phe Thr Pro  
65 70 75 80

Ala Leu Pro Lys Ile Gly Ser Ile Thr Val Tyr Phe Pro Ser Arg Lys  
85 90 95

Gln Arg Asp Ser Ser Asp Phe Asp Ile Tyr Asp Ile Gly Val Ser Gly  
100 105 110

Leu Gly Ile Ile Ile Gly Met Ala Gly Tyr Trp Pro Ala Thr Pro Leu  
115 120 125

Val Pro Ile Asn Ser Ser Gly Ile Tyr Ile Asp Pro Val Gly Ala Asn  
130 135 140

Thr Asn Pro Asn Thr Tyr Asn Gly Ala Thr Ala Ser Phe Gly Ala Arg  
145 150 155 160



Leu Phe Val Ala Phe Val Ala Thr Gly Arg Leu Pro Asn Gly Tyr Ile  
165 170 175

Thr Ile Pro Thr Arg Gln Leu Gly Thr Ile Leu Leu Glu Ala Lys Arg  
180 185 190

Thr Ser Leu Asn Asn Lys Gly Leu Thr Ala Pro Val Met Leu Asn Gly  
195 200 205

Gly Arg Ile Gln Val Gln Ser Gln Thr Cys Thr Met Gly Gln Lys Asn  
210 215 220

Tyr Val Val Pro Leu Asn Thr Val Tyr Gln Ser Gln Phe Thr Ser Leu  
225 230 235 240

Tyr Lys Glu Ile Gln Gly Gly Lys Ile Asp Ile His Leu Gln Cys Pro  
245 250 255

Asp Gly Ile Asp Val Tyr Ala Thr Leu Thr Asp Ala Ser Gln Pro Val  
260 265 270

Asn Arg Thr Asp Ile Leu Thr Leu Ser Ser Glu Ser Thr Ala Lys Gly  
275 280 285

Phe Gly Ile Arg Leu Tyr Lys Asp Ser Asp Val Thr Ala Ile Ser Tyr  
290 295 300

Gly Glu Asp Ser Pro Val Lys Gly Asn Gly Ser Gln Trp His Phe Ser  
305 310 315 320

Asp Tyr Arg Gly Glu Val Asn Pro His Ile Asn Leu Arg Ala Asn Tyr  
325 330 335

Ile Lys Ile Ala Asp Ala Thr Thr Pro Gly Ser Val Lys Ala Ile Ala  
340 345 350

Thr Ile Thr Phe Ser Tyr Gln  
355

<210> 57  
<211> 844  
<212> PRT

<213> Escherichia coli

<400> 57

Met Asn Ala Asn Asn Leu Ser Cys Leu Ile Tyr Cys Arg Cys Ser Leu  
1 5 10 15

Leu Leu Phe Ala Ala Leu Gly Leu Thr Val Thr Asn His Ser Phe Ala  
20 25 30

Ala Glu Glu Ala Glu Phe Asp Ser Glu Phe Leu His Leu Asp Lys Gly  
35 40 45

Ile Asn Ala Ile Asp Ile Arg Arg Phe Ser His Gly Asn Pro Val Pro  
50 55 60

Glu Gly Arg Tyr Tyr Ser Asp Ile Tyr Val Asn Asn Val Trp Lys Gly  
65 70 75 80

Lys Ala Asp Leu Gln Tyr Leu Arg Thr Ala Asn Thr Gly Ala Pro Thr  
85 90 95

Leu Cys Leu Thr Pro Glu Leu Leu Ser Leu Ile Asp Leu Val Lys Asp  
100 105 110

Thr Met Ser Gly Asn Thr Ser Cys Phe Pro Ala Ser Thr Gly Leu Ser  
115 120 125

Ser Ala Arg Ile Asn Phe Asp Leu Ser Thr Leu Arg Leu Asn Ile Glu  
130 135 140

Ile Pro Gln Ala Leu Leu Asn Thr Arg Pro Arg Gly Tyr Ile Ser Pro  
145 150 155 160

Ala Gln Trp Gln Ser Gly Val Pro Ala Ala Phe Ile Asn Tyr Asp Ala  
165 170 175

Asn Tyr Tyr Gln Tyr Ser Ser Ser Gly Thr Ser Asn Glu Gln Thr Tyr  
180 185 190

Leu Gly Leu Lys Ala Gly Phe Asn Leu Trp Gly Trp Ala Leu Arg His  
195 200 205

Arg Gly Ser Glu Ser Trp Asn Asn Ser Tyr Pro Ala Gly Tyr Gln Asn

210		215		220
Ile Glu Thr Ser Ile Met His Asp Leu Ala Pro Leu Arg Ala Gln Phe				
225		230		240
Thr Leu Gly Asp Phe Tyr Thr Asn Gly Glu Leu Met Asp Ser Leu Ser				
	245		250	255
Leu Arg Gly Val Arg Leu Ala Ser Asp Glu Arg Met Leu Pro Gly Ser				
	260		265	270
Leu Arg Gly Tyr Ala Pro Ala Val Arg Gly Ile Ala Asn Ser Asn Ala				
	275		280	285
Lys Val Thr Ile Tyr Gln Asn Ala His Ile Leu Tyr Glu Thr Thr Val				
	290		295	300
Pro Ala Gly Pro Phe Val Ile Asn Asp Leu Tyr Pro Ser Gly Tyr Ala				
305		310		320
Gly Asp Leu Leu Val Lys Ile Thr Glu Ser Asn Gly Gln Thr Arg Met				
	325		330	335
Phe Thr Val Pro Phe Ala Ala Val Ala Gln Leu Ile Arg Pro Gly Phe				
	340		345	350
Ser Arg Trp Gln Met Ser Val Gly Lys Tyr Arg Tyr Ala Asn Lys Thr				
	355		360	365
Tyr Asn Asp Leu Ile Ala Gln Gly Thr Tyr Gln Tyr Gly Leu Thr Asn				
	370		375	380
Asp Ile Thr Leu Asn Ser Gly Leu Thr Thr Ala Ser Gly Tyr Thr Ala				
385		390		400
Gly Leu Ala Gly Leu Ala Phe Asn Thr Pro Leu Gly Ala Ile Ala Ser				
	405		410	415
Asp Ile Thr Leu Ser Arg Thr Ala Phe Arg Tyr Ser Gly Val Thr Arg				
	420		425	430
Lys Gly Tyr Ser Leu His Ser Ser Tyr Ser Ile Asn Ile Pro Ala Ser				
	435		440	445

Asn Thr Asn Ile Thr Leu Ala Ala Tyr Arg Tyr Ser Ser Lys Asp Phe  
450 455 460

Tyr His Leu Lys Asp Ala Leu Ser Ala Asn His Asn Ala Phe Ile Asp  
465 470 475 480

Asp Val Ser Val Lys Ser Thr Ala Phe Tyr Arg Pro Arg Asn Gln Phe  
485 490 495

Gln Ile Ser Ile Asn Gln Glu Leu Gly Glu Lys Trp Gly Gly Met Tyr  
500 505 510

Leu Thr Gly Thr Thr Tyr Asn Tyr Trp Gly His Lys Gly Ser Arg Asn  
515 520 525

Glu Tyr Gln Ile Gly Tyr Ser Asn Phe Trp Lys Gln Leu Gly Tyr Gln  
530 535 540

Ile Gly Leu Ser Gln Ser Arg Asp Asn Glu Gln Gln Arg Arg Asp Asp  
545 550 555 560

Arg Phe Tyr Ile Asn Phe Thr Leu Pro Leu Gly Gly Ser Val Gln Ser  
565 570 575

Pro Val Phe Ser Thr Val Leu Asn Tyr Ser Lys Glu Glu Lys Asn Ser  
580 585 590

Ile Gln Thr Ser Ile Ser Gly Thr Gly Gly Glu Asp Asn Gln Phe Ser  
595 600 605

Tyr Gly Ile Ser Gly Asn Ser Gln Glu Asn Gly Pro Ser Gly Tyr Ala  
610 615 620

Met Asn Gly Gly Tyr Arg Ser Pro Tyr Val Asn Ile Thr Thr Thr Val  
625 630 635 640

Gly His Asp Thr Gln Asn Asn Asn Gln Arg Ser Phe Gly Ala Ser Gly  
645 650 655

Ala Val Val Ala His Pro Tyr Gly Val Thr Leu Ser Asn Asp Leu Ser  
660 665 670

Asn Thr Phe Ala Ile Ile His Ala Glu Gly Ala Gln Gly Ala Val Ile  
675 680 685

Asn Asn Ala Ser Gly Ser Arg Leu Asp Phe Trp Gly Asn Gly Val Val  
690 695 700

Pro Tyr Val Thr Pro Tyr Glu Lys Asn Gln Ile Ser Ile Asp Pro Ser  
705 710 715 720

Asn Leu Asp Leu Asn Val Glu Leu Ser Ala Thr Glu Gln Glu Ile Ile  
725 730 735

Pro Arg Ala Asn Ser Ala Thr Leu Val Lys Phe Asp Thr Lys Thr Gly  
740 745 750

Arg Ser Leu Leu Phe Asp Ile Arg Met Ser Thr Gly Asn Pro Pro Pro  
755 760 765

Met Ala Ser Glu Val Leu Asp Glu His Gly Gln Leu Ala Gly Tyr Val  
770 775 780

Ala Gln Ala Gly Lys Val Phe Thr Arg Gly Leu Pro Glu Lys Gly His  
785 790 795 800

Leu Ser Val Val Trp Gly Pro Asp Asn Lys Asp Arg Cys Ser Phe Val  
805 810 815

Tyr His Val Ala His Asn Lys Asp Asp Met Gln Ser Gln Leu Val Pro  
820 825 830

Val Leu Cys Ile Gln His Pro Asn Gln Glu Lys Thr  
835 840

<210> 58  
<211> 277  
<212> PRT  
<213> Escherichia coli

<400> 58

Met Val Lys Cys His Thr Leu Ile Asn Arg Arg Asn Lys Cys Leu Leu  
1 5 10 15

Ile Val Phe Ile Val Leu Ile Gly Trp Ile Ile Phe Arg Pro Lys Ala

20

25

30

Tyr Thr Tyr Ser Leu Asn Asp Lys Glu Lys Glu Met Leu Ile Met Leu  
                   35                  40                  45

Ser Gln His Pro Glu Thr Arg Tyr Phe Gly Phe Tyr Ser Ile Glu Leu  
           50                  55                  60

Pro Ala Asp Tyr Lys Pro Thr Gly Met Val Met Phe Ile Gln Gly Ser  
   65                  70                  75                  80

Ala Met Ile Pro Val Glu Thr Lys Leu Gln Tyr Tyr Pro Pro Phe Leu  
                   85                  90                  95

Gln Tyr Met Thr Arg Tyr Glu Ala Glu Leu Lys Asn Thr Ser Ala Leu  
           100                  105                  110

Asp Pro Leu Asp Thr Pro Tyr Leu Lys Gln Val His Pro Leu Ser Pro  
           115                  120                  125

Pro Met Asn Gly Val Ile Phe Glu Arg Met Lys Ala Lys Tyr Thr Pro  
   130                  135                  140

Asp Phe Ala Arg Val Leu Asp Ala Trp Lys Trp Glu Asn Gly Val Thr  
   145                  150                  155                  160

Phe Ser Val Lys Ile Glu Ala Lys Asp Gly Arg Ala Thr Arg Tyr Asp  
                   165                  170                  175

Gly Ile Ser Lys Ile Ala Glu Tyr Ser Tyr Gly Tyr Asn Ile Pro Glu  
           180                  185                  190

Lys Lys Val Gln Leu Leu Thr Ile Leu Ser Gly Leu Gln Pro Arg Ala  
   195                  200                  205

Asp Asn Gln Pro Pro Ser Glu Asn Lys Leu Ala Ile Gln Tyr Ala Gln  
   210                  215                  220

Val Asp Ala Ser Leu Leu Gly Glu Tyr Glu Leu Ser Val Asp Tyr Lys  
   225                  230                  235                  240

Asn Ser Asn Asn Ile Lys Ile Ser Leu Gln Thr Asp Asn Asn Ser Tyr  
                   245                  250                  255

Ile Asp Ser Leu Leu Asp Ile Arg Tyr Pro Ser Asn Gly Asn Arg Ala  
260 265 270

Trp Tyr Asn Ser Ile  
275

<210> 59  
<211> 366  
<212> PRT  
<213> Escherichia coli

<400> 59

Met Leu Pro Glu Pro Val Tyr Arg Arg Trp Ile Ile Leu Leu Ile Ser  
1 5 10 15

Met Leu Thr Val Gly Thr Leu Phe Ile Leu Ser Val Trp Asn Ser Ala  
20 25 30

Thr Tyr Trp Asp Ile Phe Ile Tyr Gly Val Leu Pro Met Leu Phe Leu  
35 40 45

Trp Leu Cys Leu Phe Gly Ile Ala Leu Asn Lys Tyr Glu Gln Ser Val  
50 55 60

Ala Ala Cys Ile Ser Trp Glu Ser Glu Arg Gln Gln Val Lys Gln Leu  
65 70 75 80

Trp Gln His Trp Ser Gln Lys Gln Leu Ala Ile Val Gly Asn Val Leu  
85 90 95

Phe Thr Pro Glu Glu Lys Gly Met Ser Val Leu Leu Gly Pro Gln Glu  
100 105 110

Glu Ile Pro Ala Tyr Pro Lys Lys Ala Arg Pro Leu Phe Ser Ala Ser  
115 120 125

Arg Tyr Ser Leu Ser Ser Ile Phe His Asp Ile His Gln Gln Leu Thr  
130 135 140

Gln Gln Phe Pro Asp Tyr Arg His Tyr Leu His Thr Ile Tyr Val Leu  
145 150 155 160

Gln Pro Glu Lys Trp Arg Gly Glu Thr Val Arg Gln Ala Ile Phe His  
165 170 175

Gln Trp Asp Leu Val Pro Glu Arg Thr Asn Thr Leu Asn Gln Ile Gln  
180 185 190

Ser Leu Tyr Asp Glu Arg Phe Asp Gly Leu Ile Leu Val Val Cys Leu  
195 200 205

Gln Asn Trp Pro Glu Asn Lys Pro Glu Asp Thr Ser Glu Leu Val Ser  
210 215 220

Ala Gln Leu Ile Ser Ser Ser Ser Phe Val Arg Gln His Gln Ile Pro  
225 230 235 240

Val Ile Ala Gly Leu Gly Arg Val Met Pro Leu Glu Pro Glu Glu Leu  
245 250 255

Glu His Asn Leu Asp Val Leu Phe Glu Tyr Asn Gln Leu Asp Asn Lys  
260 265 270

Gln Leu Gln His Val Trp Val Ser Gly Leu Asp Glu Gly Thr Ile Glu  
275 280 285

Asn Leu Met Gln Tyr Ala Glu Gln His Gln Trp Ser Leu Pro Lys Lys  
290 295 300

Arg Pro Leu His Met Ile Asp His Ser Phe Gly Pro Thr Gly Glu Phe  
305 310 315 320

Ile Phe Pro Val Ser Leu Ala Met Leu Ser Glu Ala Ala Lys Glu Thr  
325 330 335

Glu Gln Asn His Leu Ile Ile Tyr Gln Ser Ala Gln Tyr Ala Gln Lys  
340 345 350

Lys Ser Leu Cys Leu Ile Thr Arg Lys Leu Tyr Leu Arg Thr  
355 360 365

<210> 60  
<211> 260  
<212> PRT  
<213> Escherichia coli



<400> 60

Met Leu Asn Arg Lys Leu Asn Ile Arg Leu Arg His Ser Leu Asn Ser  
1 5 10 15

His Cys Ile Pro Ser Ile Ile Ile Asn Asn Thr Val Arg Ser Phe Gln  
20 25 30

Arg Ser Val Met Asn Thr Arg Ala Leu Phe Pro Leu Leu Phe Thr Val  
35 40 45

Ala Ser Phe Ser Ala Ser Ala Gly Asn Trp Ala Val Lys Asn Gly Trp  
50 55 60

Cys Gln Thr Met Thr Glu Asp Gly Gln Ala Leu Val Met Leu Lys Asn  
65 70 75 80

Gly Thr Ile Gly Ile Thr Gly Leu Met Gln Gly Cys Pro Asn Gly Val  
85 90 95

Gln Thr Leu Leu Gly Ser Arg Ile Ser Ile Asn Gly Asn Leu Ile Pro  
100 105 110

Thr Ser Gln Met Cys Asn Gln Gln Thr Gly Phe Arg Ala Val Glu Val  
115 120 125

Glu Ile Gly Gln Ala Pro Glu Met Val Lys Lys Ala Val His Ser Ile  
130 135 140

Ala Glu Arg Asp Val Ser Val Leu Gln Ala Phe Gly Val Arg Met Glu  
145 150 155 160

Phe Thr Arg Gly Asp Met Leu Lys Val Cys Pro Lys Phe Val Thr Ser  
165 170 175

Leu Ala Gly Phe Ser Pro Lys Gln Thr Thr Thr Ile Asn Lys Asp Ser  
180 185 190

Val Leu Gln Ala Ala Arg Gln Ala Tyr Ala Arg Glu Tyr Asp Glu Glu  
195 200 205

Thr Thr Glu Thr Ala Asp Phe Gly Ser Tyr Glu Val Lys Gly Asn Lys  
210 215 220

Val Glu Phe Glu Val Phe Asn Pro Glu Asp Arg Ala Tyr Asp Lys Val  
225 230 235 240

Thr Val Thr Val Gly Ala Asp Gly Asn Ala Thr Gly Ala Ser Val Glu  
245 250 255

Phe Ile Gly Lys  
260

<210> 61  
<211> 385  
<212> PRT  
<213> Escherichia coli

<400> 61

Val Val Ile Ile Asn Ser Thr Ile Leu Ser Gly Ala Gly Ala Ile Pro  
1 5 10 15

Ser Leu Thr Ser Leu Leu Pro Asp Ile Arg Lys Met Leu Leu Val Thr  
20 25 30

Asp Arg Asn Ile Ala Gln Leu Asp Gly Val Gln Gln Ile Arg Ala Leu  
35 40 45

Leu Glu Lys His Cys Pro Gln Val Asn Val Ile Asp Asn Val Pro Ala  
50 55 60

Glu Pro Thr His His Asp Val Arg Gln Leu Met Asp Ala Pro Gly Asp  
65 70 75 80

Ala Ser Phe Asp Val Val Val Gly Ile Gly Gly Gly Ser Val Leu Asp  
85 90 95

Val Ala Lys Leu Leu Ser Val Leu Cys His Pro Gln Ser Pro Gly Leu  
100 105 110

Asp Ala Leu Leu Ala Gly Glu Lys Pro Thr Gln Arg Val Gln Ser Trp  
115 120 125

Leu Ile Pro Thr Thr Ala Gly Thr Gly Ser Glu Ala Thr Pro Asn Ala  
130 135 140

Ile Leu Ala Ile Pro Glu Gln Ser Thr Lys Val Gly Ile Ile Ser Gln  
145 150 155 160

Val Leu Leu Pro Asp Tyr Val Ala Leu Phe Pro Glu Leu Thr Thr Ser  
165 170 175

Met Pro Ala His Ile Ala Ala Ser Thr Gly Ile Asp Ala Leu Cys His  
180 185 190

Leu Leu Glu Cys Phe Thr Ala Thr Val Ala Asn Pro Val Ser Asp Asn  
195 200 205

Ala Ala Leu Thr Gly Leu Ser Lys Leu Phe Arg His Ile Gln Pro Ala  
210 215 220

Val Asn Asp Pro Gln Asp Leu Arg Ala Lys Leu Glu Met Leu Trp Ala  
225 230 235 240

Ser Tyr Tyr Gly Gly Val Ala Ile Thr His Ala Gly Thr His Leu Val  
245 250 255

His Ala Leu Ser Tyr Pro Leu Gly Gly Lys Tyr His Leu Pro His Gly  
260 265 270

Val Ala Asn Ala Ile Leu Leu Ala Pro Cys Met Ala Phe Val Arg Pro  
275 280 285

Trp Ala Val Glu Lys Phe Ala Arg Val Trp Asp Cys Ile Pro Asp Ala  
290 295 300

Glu Thr Ala Leu Ser Ala Glu Glu Lys Ser His Ala Leu Val Thr Trp  
305 310 315 320

Leu Gln Ala Leu Val Asn Gln Leu Lys Leu Pro Asn Asn Leu Ala Ala  
325 330 335

Leu Gly Val Pro Pro Glu Asp Ile Ala Ser Leu Ser Glu Ala Ala Leu  
340 345 350

Asn Val Lys Arg Leu Met Asn Asn Val Pro Cys Gln Ile Asp Leu Gln  
355 360 365

Asp Val Gln Ala Ile Tyr Gln Thr Leu Phe Pro Gln His Pro Phe Lys  
370 375 380

Glu  
385

<210> 62  
<211> 105  
<212> PRT  
<213> Escherichia coli

<400> 62

Met Asn Ile Arg Lys Leu Phe Cys Pro Gly Asn Thr Pro Arg Ile Leu  
1 5 10 15

Leu Phe Leu Phe Phe Phe Val Val Ser Ala Ile Thr Thr Ile Ala Cys  
20 25 30

Gly Tyr Thr Glu Lys Asn Ala Thr Gly Asn Val Leu Leu Leu Phe Leu  
35 40 45

Leu Leu Leu Leu Ala His Arg Asn Thr Leu Thr Ser Ile Thr Ala Leu  
50 55 60

Leu Phe Leu Phe Cys Cys Ala Leu Tyr Ala Pro Ala Gly Met Thr Tyr  
65 70 75 80

Gly Lys Ile Asn Asn Ser Phe Ile Val Ala Leu Leu Gln Thr Thr Thr  
85 90 95

Asp Glu Ala Ala Glu Phe Thr Gly Met  
100 105

<210> 63  
<211> 147  
<212> PRT  
<213> Escherichia coli

<400> 63

Met Asn Ile Gln Ala Ile Lys Glu Met Val Asn Leu Ile Cys Ser Phe  
1 5 10 15

Leu Phe Ile Phe Phe Leu Ser Ser Ala Phe Val Ser Phe Gly Cys Tyr  
20 25 30

Ala Ile Tyr Glu Leu Phe Leu Trp Asn Asp Ile Ile Val Tyr Ser Trp  
35 40 45

Gly Tyr Ile Leu Ile Val Phe Leu Pro Phe Thr Leu Tyr Val Met Ser  
50 55 60

Phe Glu Ile Leu Phe Phe Ala Ile Ser Gly Arg Arg Leu Ser Lys Val  
65 70 75 80

Thr Met Val Arg Leu Trp Leu Ile Ile Lys Ile Ile Ile Ala Phe Ser  
85 90 95

Ile Cys Ala Val Leu Ile Phe Ser Ser Ile Tyr Lys Lys Glu Leu Leu  
100 105 110

Ser Arg Asn Tyr Ile Ala Cys Ser Gly Ile Pro Ser Gly Trp Met Pro  
115 120 125

Gly Leu Ala Thr Lys Tyr Val Lys Glu Lys Ser Leu Cys Glu Lys Asn  
130 135 140

Gly Asn Asn  
145

<210> 64  
<211> 178  
<212> PRT  
<213> Escherichia coli

<400> 64

Met Phe Pro Ile Arg Phe Lys Arg Pro Ala Leu Leu Cys Met Ala Met  
1 5 10 15

Leu Thr Val Val Leu Ser Gly Cys Gly Leu Ile Gln Lys Val Val Asp  
20 25 30

Glu Ser Lys Ser Val Ala Ser Ala Val Phe Tyr Lys Gln Ile Lys Ile  
35 40 45

Leu His Leu Asp Phe Phe Ser Arg Ser Ala Leu Asn Thr Asp Ala Glu  
50 55 60

Asp Thr Pro Leu Ser Thr Met Val His Val Trp Gln Leu Lys Thr Arg  
65 70 75 80

Glu Asp Phe Asp Lys Ala Asp Tyr Asp Thr Leu Phe Met Gln Glu Glu  
85 90 95

Lys Thr Leu Glu Lys Asp Val Leu Ala Lys His Thr Val Trp Val Lys  
100 105 110

Pro Glu Gly Thr Ala Ser Leu Asn Val Pro Leu Asp Lys Glu Thr Gln  
115 120 125

Phe Val Ala Ile Ile Gly Gln Phe Tyr His Pro Asp Glu Lys Ser Asp  
130 135 140

Ser Trp Arg Leu Val Ile Lys Arg Asp Glu Leu Glu Ala Asp Lys Pro  
145 150 155 160

Arg Ser Ile Glu Leu Met Arg Ser Asp Leu Arg Leu Leu Pro Leu Lys  
165 170 175

Asp Lys

<210> 65  
<211> 209  
<212> PRT  
<213> Escherichia coli

<400> 65

Met Phe Leu Lys Arg Lys Trp Tyr Tyr Ala Val Thr Thr Ser Val Val  
1 5 10 15

Ile Thr Leu Cys Gly Gly Gly Tyr Tyr Met Tyr Arg Gln Glu Tyr Gln  
20 25 30

Met Val Val Thr Val Pro Thr Ala Asp Ala Asn Asp Pro Asn Trp Pro  
35 40 45

Asn Lys Arg Ile Gln Phe Asp Thr Ser Glu Trp Leu Gln Gln Leu Gln  
50 55 60

Tyr Ile Lys Ile Asp Asp His Tyr Ile Leu Asn Thr Gln Tyr Thr Pro  
65 70 75 80

Ile Ala Asn Leu Asp Asp Phe Gly Ile Thr Leu Lys Leu Gln Asn Ala  
85 90 95

Leu Asn Gly Ser Asp Lys Arg Leu Pro Ala Leu Tyr Gly Leu Ala Glu  
100 105 110

Met Asp Ala Gln Lys Phe Lys Asp Leu Met Arg Gly Lys Ile Lys Cys  
115 120 125

Glu Tyr Leu Arg Thr Thr Phe Asp Ala Glu Thr Leu Lys Pro Val Asn  
130 135 140

Asp Tyr Phe Leu Ile Ser Phe Thr Tyr Lys Asp Lys Trp Tyr Glu Phe  
145 150 155 160

Glu Thr Glu Arg Lys Ile Ser Lys Thr Ser Asp Asp Gly Tyr Phe Leu  
165 170 175

Trp Ala Phe Asp Asn Thr Val His Glu Ala Gly Tyr Trp His Asn Thr  
180 185 190

Asp Pro Ala Ala Tyr Ser Tyr Arg Asp Tyr Gln Asn Gly Lys Ala Val  
195 200 205

Lys

<210> 66  
<211> 424  
<212> PRT  
<213> Escherichia coli

<400> 66

Met Asp Ile Trp Arg Gly His Ser Phe Leu Met Thr Ile Ser Ala Arg  
1 5 10 15

Phe Arg Gln Tyr Val Phe Ser Leu Met Ser Ile Leu Leu Gln Glu Arg  
20 25 30

Lys Met Asn Ile Phe Thr Leu Ser Lys Ala Pro Leu Tyr Leu Leu Ile

35

40

45

Ser Leu Phe Leu Pro Thr Met Ala Met Ala Ile Asp Pro Pro Glu Arg  
50 55 60

Glu Leu Ser Arg Phe Ala Leu Lys Thr Asn Tyr Leu Gln Ser Pro Asp  
65 70 75 80

Glu Gly Val Tyr Glu Leu Ala Phe Asp Asn Ala Ser Lys Lys Val Phe  
85 90 95

Ala Ala Val Thr Asp Arg Val Asn Arg Glu Ala Asn Lys Gly Tyr Leu  
100 105 110

Tyr Ser Phe Asn Ser Asp Ser Leu Lys Val Glu Asn Lys Tyr Thr Met  
115 120 125

Pro Tyr Arg Ala Phe Ser Leu Ala Ile Asn Gln Asp Lys His Gln Leu  
130 135 140

Tyr Ile Gly His Thr Gln Ser Ala Ser Leu Arg Ile Ser Met Phe Asp  
145 150 155 160

Thr Pro Thr Gly Lys Leu Val Arg Thr Ser Asp Arg Leu Ser Phe Lys  
165 170 175

Ala Ala Asn Ala Ala Asp Ser Arg Phe Glu His Phe Arg His Met Val  
180 185 190

Tyr Ser Gln Asp Ser Asp Thr Leu Phe Val Ser Tyr Ser Asn Met Leu  
195 200 205

Lys Thr Ala Glu Gly Met Lys Pro Leu His Lys Leu Leu Met Leu Asp  
210 215 220

Gly Thr Thr Leu Ala Leu Lys Gly Glu Val Lys Asp Ala Tyr Lys Gly  
225 230 235 240

Thr Ala Tyr Gly Leu Thr Met Asp Glu Lys Thr Gln Lys Ile Tyr Val  
245 250 255

Gly Gly Arg Asp Tyr Ile Asn Glu Ile Asp Ala Lys Asn Gln Thr Leu



260

265

270

Leu Arg Thr Ile Pro Leu Lys Asp Pro Arg Pro Gln Ile Thr Ser Val  
 275 280 285

Gln Asn Leu Ala Val Asp Ser Ala Ser Asp Arg Ala Phe Val Val Val  
 290 295 300

Phe Asp His Asp Asp Arg Ser Gly Thr Lys Asp Gly Leu Tyr Ile Phe  
 305 310 315 320

Asp Leu Arg Asp Gly Lys Gln Leu Gly Tyr Val His Thr Gly Ala Gly  
 325 330 335

Ala Asn Ala Val Lys Tyr Asn Pro Lys Tyr Asn Glu Leu Tyr Val Thr  
 340 345 350

Asn Phe Thr Ser Gly Thr Ile Ser Val Val Asp Ala Thr Lys Tyr Ser  
 355 360 365

Ile Thr Arg Glu Phe Asn Met Pro Val Tyr Pro Asn Gln Met Val Leu  
 370 375 380

Ser Asp Asp Met Asp Thr Leu Tyr Ile Gly Ile Lys Glu Gly Phe Asn  
 385 390 395 400

Arg Asp Trp Asp Pro Asp Val Phe Val Glu Gly Ala Lys Glu Arg Ile  
 405 410 415

Leu Ser Ile Asp Leu Lys Lys Ser  
 420

&lt;210&gt; 67

&lt;211&gt; 489

&lt;212&gt; DNA

&lt;213&gt; Escherichia coli

&lt;400&gt; 67

atgaaactga aagctattat attggccacc ggtcttatta actgtattgt attttcagca 60  
 caggcagtg atacgacgat tactgtgacg ggtaatgttt tgcaaagaac atgtaatgta 120  
 ccagggaatg tggatgtttc tttgggtaat ctgtatgtat cagactttcc caatgcagga 180  
 agtggatctc catggggttaa ttttgatctg tctctcaccg gatgccagaa tatgaatact 240

gttcgggcaa catttagtgg tactgcggat gggcagacat actatgcgaa tacagggaa	300
gctggcggtta tcaagattga aattcaggac agggatggaa gtaatgcac atatacacaat	360
ggtatgttca agacgcttaa tgtacaaaat aataatgcaa cctttaatct taaagcccg	420
gcagtgaagta aaggccaggt tactcctgga aatatcagtt ctgttataac cgtcacctat	480
acctatg	489

<210> 68  
 <211> 2019  
 <212> DNA  
 <213> *Escherichia coli*

<400> 68	
atgaaatga cacggcttta tcctctggcc ttgggggga	60
aatgccaga cttcacagca agacgaaagc acgctggtg	120
tcccgcctcg catcagccaa caacgtctcg tctactgtg	180
gacgccggcg tcacgccag cgacaaactc cccagagtc	240
aatagcggca acatgctttt ttcgacgac tcgctacgc	300
ttctataacc ccgcgctcac cctgtatgtc gatggcgtc	360
atccagcgc ttaccgatgt gcaaaagcgtg gagttgctg	420
tatggcaaaa gcgctcagg cgggatcatc aacatcgta	480
ccgcgcggct atattgaag cggcgtcagt agccgcgaca	540
ctgagcggcc ccattcagga tggcctgctg tacggcagc	600
gatgacggcg acatgattaa ccccgcgac ggaagcgat	660
agcataggga atgtgaaact gcgtctggcg ccggacgat	720
gccgcctcac gcgaatgtac ccgcgccacc caggcgcct	780
aaggccgcta agctgtcgat cagcgatggt tcaccagacc	840
gacagccaga ccctgagtgg gaaatacacc accgatgact	900
gcctggcagc agcagcatta ttcgcgcacc ttcccttccg	960
tctcagcgt ggaatcagga tgtgcaggag ctgcgcgctg	1020
accgttgata tgggtgtttg gctgtaccgg cagaacaccc	1080
tacgacatgc cgacaatgcc ttatttaagc agtaccggct	1140

gcgcataca gtgacctgac ctggcattta accgatcggt ttgatatcgg cggcgggcgtg 1200  
cgcttctcgc atgataaatc cagtacacaa tatcacggca gcctatcggc caacccggtt 1260  
ggcgaccagg gtaagagcaa tgacgatcag gtgctcgggc agctatccgc aggctatatg 1320  
ctgaccgatg actggagagt gtatacccggt gtagccagg gatataaacc ttccgggtac 1380  
aacatcggtc ctactcgagg tcttgatgcc aaaccggttc tcgccgagaa atccatcaac 1440  
tatgaacttg gcacccgcta cgaaacggct gacgtcacgc tgcaagccgc gacgttttat 1500  
accacacaca aagacatgca gctttactct ggcccgggtc ggatgcagac attaaagcaat 1560  
gcgggtaaa cgcagccac cgcggttgag cttgaagcga agtgcggtt tcgccaggc 1620  
tggtcatggg atatcaatgg caacgtgatc cgttcggaat tcaccaatga cagtgaagt 1680  
tatcacggta accgggtgcc gttctgacca cgttatggcg cgggaacgag cgtgaacggc 1740  
gtgattgata cgcgctatgg cgactgatg ccccgactgg cggttaatct ggtcgggccc 1800  
cattatttcg atggcgacaa ccagttgagg caaggcacct atgccaccct ggacagcagc 1860  
ctgggctggc aggcgactga acggatgaac atttcggtct atgtcgataa cctgttcgac 1920  
cgctggtacc gtacctatgg ctacatgaac ggagcagcg ccgtcgcgca ggtcaatatg 1980  
ggtcgaccg tcggtatcaa tacggaatt gatttcttc 2019

<210> 69  
<211> 738  
<212> DNA  
<213> Escherichia coli

<400> 69  
atgaataagg tttttgtgt ttcagtgggt gccgcagcct gtgtatttgc agtaaatgca 60  
ggagcaaaagg aaggtaaaa cggtttttat ctgaccggta aagccgggtc ctctgtgatg 120  
tcactttcag accagcgttt cctgtcagga gatgaggaag aaacatcaaa gtataaaggc 180  
ggcgatgacc atgatacggc attcagtggc ggtattgcgg tcggttatga tttttatccg 240  
cagttcagta ttccgggttc tacagaactg gagttttacg ctctgtgaaa agctgattcg 300  
aagtataacg tagataaaga cagctgggtc ggtggttact ggcgtgatga cctgaagaat 360  
gaggtgtcag tcaacacact aatgctgaat gcgtactatg acttccggaa tgacagcgca 420  
ttcacaccat ggggtatccg agggattggc tacgccagaa ttaccagaa aacaaccggc 480  
atcagtacct gggattatga gtacggaagc agtggtcgcg aatcggttgc acgttcaggc 540  
tctgctgaca acttcgcatg gagccttggc gcgggtgtcc gctatgacgt aaccccgcat 600

atcgctctgg acctcagcta tcgctatctt gatgcagggtg acagcagtggt gagttacaag	660
gacgagtgagg gcgataaata taagtcagaa gttgatgtta aaagtcatga catcatgctt	720
ggtatgactt ataacttc	738

<210> 70  
 <211> 498  
 <212> DNA  
 <213> Escherichia coli

<400> 70	
atgaaactga aagctattat attggccacc ggtcttatta actgtattgc attttcagca	60
caggcagtggt atacgacgat tactgttaca gggaggggtat tgccacgtac ctgtaccatt	120
ggtaattggag gaaacccaaa cgccaccgtt gttttggata acgcttacac ttctgacctg	180
atagcagcca acagcaccto tcagtggaaa aatttttctg tgacattgac gaattgtcag	240
aatgtaaaca atgttacttc atttgggtga accgcagaaa atacaaatta ttacagaaat	300
acaggggatg ctactaatat catggttgag ctacaggaac aaggtaatgg taataccccc	360
ttgaaagttg gttcaacaaa agttgttaca gtgagcaatg ggcaggcgac attcaatctt	420
aaagtcctgt ccgtaagcaa aggtaatgct ggtgcgggaa gtattaattc acaaattact	480
gtcacctata cctatgct	498

<210> 71  
 <211> 3885  
 <212> DNA  
 <213> Escherichia coli

<400> 71	
atgaataaaa tatactccct taaatatagt gctgccactg gcggactcat tgctgtttct	60
gaattagcga aaagagtttc tggtaaaaa accgaaaaac ttgtagcaac aatgttgtct	120
ctggctgttg ccggtacagt aaatgcagca aatattgata tatcaaagt atggcgagaga	180
gactatcttg atcttgcaca aaataaaggt attttccagc ccggagcaac agacgttaaca	240
atcactttaa aaaacggaga taaattctct ttccataatc tctcaattcc ggatttttct	300
ggtgcagcag cgagtggcgc agctaccgca ataggaggtt cttatagtgt tactgttgca	360
cataacaaa agaaccctca ggcgcagaaa acccaggttt acgctcagtc ttcttacagg	420
gttgttgaca gaagaaattc caatgatatt gagattcaga ggttaataaa atttgtgtgtg	480

gaaacagtag	gtgccacccc	ggcagagacc	aaccctacaa	catattctga	tgcattagaa	540
cgctacggt	tagtcacttc	tgacgggttc	aaaaaatca	taggtttctg	tgctggctct	600
ggaggaacat	catttattaa	tggtgaatcc	aaaatctcaa	caaattcagc	atatagccat	660
gatctgttaa	gtgctagtct	atttgaggtc	acccaatggg	actcatacgg	catgatgatt	720
tataaaaatg	ataaaaacatt	tcgtaatctt	gaaatattcg	gagacacggg	ctctggagca	780
tacttatatg	ataacaaact	agaaaaatgg	gtattagtcg	gaacaaccca	tggtattgcc	840
agcgttaatg	gtgaccaact	gacatggata	acaaaataca	atgataaaact	ggttagttag	900
ttaaaagata	cctatagtca	taaaataaat	ctgaatggca	ataatgtaac	cattaaaaac	960
acagatataa	cattacacca	aaacaatgca	gataccactg	gtactcaaga	aaaaataact	1020
aaagacaaa	g	g	g	g	g	1080
tttggtagcg	gtggtattat	ctttgacgaa	ggccatgaat	ataacataaa	cggtcaggga	1140
tttacattta	aaggagcagg	aattgatatc	ggaaaagaaa	gcattgtaaa	ctggaatgca	1200
ttgtattcca	gtgatgatgt	tttacacaaa	ataggccccc	gtactctgaa	tgttcaaaaa	1260
aaacaggggg	caaataataa	gataggtgaa	ggaaatgtta	ttcttaatga	agaaggaaca	1320
tttaacaata	tataccttgc	aagcggaaat	ggtaaggtaa	tactaaataa	agataattcc	1380
cttgccaatg	atcaatatgc	ggggatattt	tttactaaac	gtgggtggtc	gctagattta	1440
aatggacaca	atcagacttt	tactagaatt	gccgccactg	acgatggaac	aacaataact	1500
aactcagata	caacgaaga	agccgttctg	gcaatcaata	acgaagactc	ctacatatat	1560
catgggaaca	taaatggcaa	tataaaacta	acgcacaata	ttaattctca	ggataagaaa	1620
actaatgcaa	aattaattct	ggatggtagt	gtcaacacaa	aaaatgatgt	tgaagtcagt	1680
aatgccagtc	ttaccatgca	aggccatgca	acagagcatg	caatattcag	aagctcagcg	1740
aatcattgct	ccctgggtatt	tctttgtgga	acggactggg	tcaccgtttt	gaaagaaaca	1800
gagagttcat	ataataaaaa	attcaattct	gattacaaaa	gtaataatca	gcagacctca	1860
tttgatcagc	ctgactggaa	aaccgggggtg	tttaaatttg	atacatatac	cctgaacaat	1920
gctgactttt	caatatcagc	caatgccaat	gttgaaggaa	atatatcagc	aaataaatca	1980
gctatcacia	tcggcgataa	aaatgtttac	attgataaat	ttgcagggaa	aaatattact	2040
aataatggtt	ttgacttcaa	acaaaactatc	agtactaatc	tatccatagg	agaaactaaa	2100
tttacagggtg	gcatactctg	acataacagc	caaatagcca	taggtgatca	agctgtagtt	2160
acacttaaatg	gtgcaacctt	tctggataat	actcctataa	gtatagataa	aggagcaaaa	2220

gttatagcac	aaaattccat	gttcacaaca	aaaggtattg	atatctccgg	tgaactgact	2280
atgatgggaa	tccctgaaca	gaatagtaaa	actgtaacgc	cgggtctcca	ctacgctgct	2340
gatggattca	ggctgagtgg	tggaaatgca	aatttcattg	ccagaaatat	ggcatctgtc	2400
accggaaata	tttatgctga	tgatgcagca	accattactc	tgggacagcc	tgaactgaa	2460
acaccgacta	tatcgtctgc	tatcaggca	tgggcagaga	ctcttttcta	tggctttgat	2520
accgcttata	gaggcgcaat	aacagccccc	aaagctacag	ttagcatgaa	taatgcgctc	2580
tggcatctaa	atagccagtc	atcaattaat	cgtctagaaa	caaaagacag	tatggtgcgt	2640
tttactgggtg	ataatgggaa	gtttacaacc	cttacagtga	acaaccttac	tatagatgac	2700
agtgcatttg	tgctgcgtgc	aaatctggcc	caagcagatc	agcttgttgt	caataaatcg	2760
ttgtctggta	aaaacaacct	tctgttagtc	gacttcattg	agaaaaatgg	aaacagcaac	2820
ggactgaata	tcgatctggt	cagcgcacca	aaaggaaactg	cagtagatgt	ctttaagct	2880
acgactcgga	gtattggcct	cagtgatgta	acaccgggta	tcgagcaaaa	gaacgataca	2940
gacaaagcaa	catggactct	gatcggtctat	aaatctgtgg	ccaacgccga	tgcggtctaaa	3000
aaggcaacat	tactgatgtc	aggcggtctat	aaagccttcc	ttgctgaggt	caacaacctt	3060
aacaaacgta	tggtgatctc	gcgtgacatt	aacggtgagt	ccgggtgcgt	ggcccgaatc	3120
attagcggaa	ccgggtctgc	cgcggtgga	ttcagtga	actacacca	cgttcaggtc	3180
ggtgcggata	acaaacatga	actcgatggc	cttgacctct	tcaccggggg	gacctgacc	3240
tataaccgaca	gccatgcagg	cagtgatgcc	ttcagtggtg	aaacgaagtc	tgtgggtgcc	3300
ggtctctatg	cctctgccat	gtttgagtcc	ggagcatata	tcgacctcat	cgttaagtac	3360
gttcaccatg	acaacgagta	taccgcaact	ttcgccggcc	ttggcaccag	agactacagc	3420
tcccactcct	ggatgcccgg	tgcggaagtc	ggttacccgtt	accatgtaac	tgactctgca	3480
tggattgagc	cgagggcgga	acttgtttac	ggtgctgtat	ccgggaaaca	gttctcctgg	3540
aaggaccagg	gaatgaacct	caccatgaag	gataaggact	ttaatccgct	gattgggcgt	3600
accggtgttg	atgtgggtaa	atccttctcc	ggtaaggact	ggaaagtac	agcccgcgcc	3660
ggccttggct	accgatttga	cctgtttgcc	aacggtgaaa	ccgtactcgc	tgatgcgtcc	3720
ggtgagaaac	gtatcaaagg	tgaaaaagac	ggtcgtatgc	tcatgaatgt	tggctctaac	3780
gccgaaattc	gcgataatct	tcgcttcggt	cttgagtttg	agaaatcgcc	atttggtaaa	3840
tacaacgtgg	ataacgcgat	caacgccaac	ttccgttact	ctttc		3885

<210> 72  
 <211> 426  
 <212> DNA  
 <213> Escherichia coli

<400> 72

atgattaata ttcccagtc caccgctgtt gttatggcgc tggtagccat cagcacgctt	60
cccagcccta gcagggttaa gcttatgcca tatcctccca gagcccacaa caccacaggt	120
ttactgccag tacgggaaat ttgctttccc caccacgggg acgatggcag aaacagcatt	180
gagccaagca tcagcagggc agcccataca gacagactca gatttgtctg tatgaccaga	240
acaggggagca caaccagcag accgtttctgc cggataccga gaagcccggc actgaacgca	300
agtggccagc aggacagtgg tttttggggc gtatcttcga tcccagggtga cattttaatg	360
tttcaactcc atgtattaat tgtgtttatt tgtaaaatta atttatctga caataacatt	420
tcttat	426

<210> 73  
 <211> 954  
 <212> DNA  
 <213> Escherichia coli

<400> 73

atgtatgccc gcgagtatcg ctcaacacgc ccgataaaag cgattttctt tcattttctt	60
tgctcacc cttatctgtag tgcgcaagtt tatgcgaagc cggatatgcg gccactgggg	120
ccgaatatag ccgataaagg ctccgtgttt taccatttca gcgccacctt ttccgactct	180
gtcgtatggca cagccatta tcgggtatgg acggccgtgc cgaatacaac cgcaccggca	240
tcgggttacc cgattttata tatgcttgac ggtaacgcag ttatggaccg cctggatgac	300
gaactgctca aacaattgtc agaaaaaaca ccgccagtga tcgtggctgt cgggtatcag	360
accaacctcc ctttcgatct caacagcagg gcttacgact atacgccagc agcagaaaagc	420
agaaaaacag atctccactc agggcggttt agccgtaaga gtgggtggag caacaacttc	480
cgccagttac tggaaacgcg tattgcccc aagtggaac agggactgaa tatcgatcgg	540
caacgcgcgc gcttatgggg gcaactctac ggcgccctct tcgtgtcggg ttcttggtg	600
tcctctctt acttccggtc gtactacagc gccagcccg cgttgggagc aggttatgat	660
gctttgctaa gccgcgttac ggcggttgag cctctgcaat tctgcacaa acacctggcg	720
ataatggaag gctcggcgac acagggtgat aaccgggaaa cgcgtgctgt cggggtgctg	780

tcgaaaattc ataccaccct cactatactg aaagataaag gcgtcaatgc cgtattttgg	840
gatttcccca acctgggaca cgggccgatg ttcaatgcct cctttcccca ggactgtta	900
gatatcagtg gtgaaaacgc aaattacaca gcagggtgtc atgagttaag ccac	954

<210> 74  
 <211> 2175  
 <212> DNA  
 <213> Escherichia coli

<400> 74	
atgagaatta acaaaatcct ctggctcgcta actgtgctcc tagttggggt gaatagccag	60
gtatcagtag ccaaaatactc cgacgatgat aatgacgaga ctctgggtgtt ggaagccacc	120
gctgagcagg tattaataca gcagccgggc gtgtcgggta ttaccagca ggatattaaa	180
aagaccctc cggtaaacga cctttcagat attattcgta aaatgcctgt tgtaaatctt	240
accggcaata gcgcctcggg cacacgcggg aataaccgcc agatcgatat tcgtgggtatg	300
gggcccgaata acaccttaat ttaattgat ggtgtaccgg tgacgtcacg taactccgtg	360
cgttatagct ggctggggga gcgtgatacc cgcgggtgaca ccaactgggt gccaccggaa	420
caggttgagc gtattgaagt gatccgcggc cctgcggcgg cgcgctacgg ttccgggggcc	480
gccggggggg tggatgaacat cattacaaaa cgtcccacca acgactggca cggttcgtcg	540
tcgttatata ccaaccagcc ggaaagtagc gaagaggggc ctacgcgtcg cgccaatttc	600
agccttagtg ggcctctggc tggatgatgct cttaccacgc gtttgtatgg taacctgaat	660
aaaacggatg ctgacagttg ggatattaat tctccgggtc gtacgaaaaa cgcagccggg	720
catgaagggg tacgtaacaa agatattaac ggctgtgtct cgtggaaatt aaatccgcag	780
cagattctcg atttcgaagt cggatatagc gccacgggga atatctatgc gggcgatacg	840
cagaacagtt cttccagtgc agttaccgaa agcctggcaa aatccggcaa agagacgaac	900
cgctgtgacc gacagaatta tggcattacg cataatggta tctgggactg gggacaaagt	960
cgctttgtg tttattacga gaaaaccaat aatacccgca tgaatgaagg attatccggc	1020
ggtgtgtaag gacgtatatt agcgggtgaa aagtttacga ccaatcgctt gatttctctg	1080
cgaaccagcg gtgagcttaa tattcctttg aatgtgatgg ttgatcaaac gctgaccgtt	1140
ggtgcagagt ggaaccgcga taagctcgat gatccttctt ctaccagcct gacggtgaat	1200
gacagagata tcagcgggat ttctggctct gctgcggatc gcagcagtaa aaatcattct	1260



caaatcagtg	cgctgtatat	tgaagataac	attgagccgg	ttcctggcac	gaatatcatt	1320
cccggcctgc	gctttgatta	tctcagcgac	tccggcggga	acttcagccc	cagcttgaat	1380
ctttcgcagg	aattggggcga	ttatttcaaa	gtcaaagcag	gggttgcccc	aacctttaaa	1440
gccccaaacc	tgtatcaatc	cagtgaaggc	tatctgctct	actcgaagg	caatggctgt	1500
ccaaaagata	ttacatcagg	cggggtgctac	ctgatcggtg	ataaagatct	cgatccggaa	1560
atcagcgtca	ataaagaaat	tggactggag	ttcacctggg	aagattacca	cgcaagtgtg	1620
acctacttcc	gcaatgatta	ccagaataag	atcgtggccg	gggataacgt	tatcggggcaa	1680
accgcttcag	gcgcatatat	cctcaagtgg	cagaatggcg	ggaagctctc	ggtggacggt	1740
atcgaagcca	gtatgtcttt	cccactgggtg	aaagagcgtc	tgaactggaa	taccaatgcc	1800
acatggatga	tcacttcgga	gcaaaaagac	accggaatc	ctctgtcggt	catccggaaa	1860
tatactatca	ataactcgct	taactggacc	atcacccagg	cgttttctgc	cagcttcaac	1920
tggacgttat	atggcagaca	aaaaccgcgt	actcatgcgg	aaaccgcgag	tgaagatact	1980
ggcggctctg	caggtaaaga	gctgggcgct	tattcactgg	tggggacgaa	cttcaattac	2040
gatattaata	aaaatctgcg	tcttaatgtc	ggcgtagta	atatcctcaa	taaacagatc	2100
ttccgatctt	ctgaaggggc	gaatacctat	aacgagccag	gccgggctta	ttatgcggga	2160
gttaccgcat	cattc					2175

<210> 75  
 <211> 3042  
 <212> DNA  
 <213> Escherichia coli

<400> 75	
atgggtaacc	aatggcaaca
aaaatatctt	cttgagtaca
atgagttggt	atcaaatctc
60	
ccttcacctg	aaagagttgt
cagcgattac	attaagaatt
gttttaaac	tgacttgcg
120	
tggtttagtc	ggattgatcc
tgataatgct	tatttcatct
gcttttctca	aaaccggagt
180	
aatagcagat	cttatactgg
atgggatcat	cttgggaaat
ataaaacaga	agtactgaca
240	
ctcactcaag	ccgctcttat
taatattggt	tatcgttttg
atgtttttga	tgatgcaaat
300	
tcaagcacag	gaattttata
aacaaagagt	gcagatgtgt
ttaacgaaga	aaatgaagaa
360	
aaaatgctcc	cgctcggaata
cctgcatttt	ttacaaaagt
gtgattttgc	aggtgtttat
420	
ggaaaaactc	tgtcagatta
ctggtcgaaa	tactatgata
aatttaagct	tttactaaaa
480	
aattattata	tttcttctgc
tttgatatct	tataaaaatg
gagagcttga	tgagcgtgaa
540	

tataatttct ccatgaacgc cttaaatcgc agtgataata taccactatt attctttgat	600
atttatggat attacgcato tgatatTTTT gtagccaaaa ataatagataa ggtaatgctt	660
ttcattcctg gtgcaaaaa accTTTTtTa ttcaagaaga atatcgctga ttgCGgctt	720
acccttaaa aacttattaa ggatagtgac aacaaacaat tactttccca acatttttca	780
ttatatagtc gtcaagatgg agtttcctat gcaggagtaa attctgttct acatgcaata	840
gaaaaatgat gtaattttaa tgaagtctac tttctgtatt ccaataagac acttagcaat	900
aaagatgttt ttgatgctat agctatttct gttaagaaac gcagtttcag tgatggatgat	960
atcgttataa aatcaaacag tgaagctcaa cgagactatg ctctgactat actccagacg	1020
attttatcaa tgacctctat atttgatata gtagtcccg aggtatctgt tccgcttgga	1080
ctggggatta ttacttccag tatggggatc agttttgatc aactgattaa tggtgatact	1140
tatgaagaac gtctgttctgc tatacctggt ttggcgacaa atgcagtatt gcttggtctg	1200
tcttttgcaa ttccactctt gattagtaag gcaggaataa accaggaggt acttagcagc	1260
gttataaata atgagggcag gactctgaat gaaacaaata tcgatataatt ttgaaggaa	1320
tatggaattg ctgaagatag tatatcctca actaatttgt tagacgttaa gcttaaaagt	1380
tcggggcagc atgtcaatat tgtaaagctt agtgatgaag ataatacaat tgcgctgtga	1440
aaaggaggtt ctctgagcgg catctactat gaagtggaca ttgaaacagg atatgagatt	1500
ttatccgcaa gaatttatcg taccgaatat aataatgaaa ttctctggac tcgaggtgggt	1560
gggtctaaaag gggggcagcc atttgatttt gaaagtctca atattcctgt atttttttaa	1620
gatgaaccct attctgcagt gaccgatctt ccgttatcat ttattaatga tgacagctca	1680
cttttatatc ctgatacaaa cccaaaatta ccgcaaccaa cgtcagaaat ggatattgtt	1740
aattatgtta aggtttctgg aagctttggg gatagatttg taactttgat gagaggagct	1800
actgaggaag aagcatggaa tattgcctct tatcatacgg ctgggggaag tacagaagaa	1860
ttacacgaaa ttttgttagg tcagggccca cagtcaagct taggttttac tgaatatacc	1920
tcaaatgtta acagtgcaga tgcagcaagc agacgacact ttctggtagt tataaaagt	1980
cacgtaaaat atatcaccaa taataatgtt tcatatgtta atcattgggc aattcctgat	2040
gaagccccgg ttgaagtact ggctgtggtt gacaggagat ttaattttcc tgagccatca	2100
acgcctcctg atatatcaac catacgtaaa ttgttatctc tacgatattt taaagaaagt	2160
atcgaaagca cctccaatc taactttcag aaattaagtc gcggaatat tgatgtgctt	2220

aaaggacggg gaagtatttc atcgacacgt cagcgtgcaa tctatccgta ttttgaagcc	2280
gctaattgctg atgagcaaca acctctcttt ttctacatca aaaaagatcg ctttgataac	2340
catggctatg atcagttatt ctatgataat acagtggggc taaatgggat tccaacattg	2400
aacacctata ctgggggaaat tccatcagac tcattcttcac tcgggtcaac ttattggaag	2460
aagtataatc ttactaatga aacaagcata attcgtgtgt caaattctgc tcgtggggcg	2520
aatggtatta aaatagcact tgaggaagtc caggagggta aaccagtaat cattacaagc	2580
ggaaatctaa tgggttgtag gacaattgtt gcccgaaaag aaggatatat ttataaggta	2640
catactggta caacaaaatc tttggctgga ttaccagta ctaccggggt gaaaaagca	2700
gttgaagtac ttgagctact tacaaaagaa ccaatacctc gcgtggaggg aataatgagc	2760
aatgatttct tagtcgatta tctgtcggaa aattttgaag attcattaat aacttactca	2820
tcattctgaaa aaaaaccaga tagtcaaatc actattatc gtgataatgt ttctgttttc	2880
ccttacttcc ttgataatat acctgaacat ggctttggta catcgggcag tgtaactggtg	2940
agagtggagc gcaatgttgt cgtaaggctc ctgtctgaga gttattctct gaatgcagat	3000
gcctccgaaa tatcggtatt gaaggatttt tcaaaaaaat tt	3042

<210> 76  
 <211> 1362  
 <212> DNA  
 <213> *Escherichia coli*

<400> 76	
atggtggaca tgattaatga aagtgcacgg caaacgccag tcattgcaca aacggacgtt	60
ctggttatcg ggggcgggtcc ggcaggatta tccgctgcc a ttgcggcagg gcggttaggt	120
gccagaacca tgattgttga gcgctacggg tcgctaggcg gcgtattgac gcaggtcggg	180
gtagaaagtt ttgcctggta tcgtcatccg gggacggaag attgtgaagg gatctgtcgt	240
gagtatgaag gccgcgcacg agcgctgggt ttcacacgac cagaacctca gtcaattagc	300
gaagttatag atactgaagg atttaaagtt gtcgccgac agatgattac ggaatctggc	360
gttgagccgt tatatcactc ctgggttggt gacgtgatca aggacgggga tacgttatgc	420
ggtgttatcg tcgagaataa atcaggtcga ggggcaattc tggcgaaaag aatcgtcgat	480
tgcacggggg atgctgatat tgccgctcgt gcaggcgcgc cctggacgaa acggagcaag	540
gaccaactga tgggcgtcac cgtgatgttc agttgcgcag gtgttgatgt ggcacgcttt	600
aaccgttttg ttgcggaaga acttaagccg acctacgcgg attggggcaa aaactggacg	660

attcaaacca	cgggtaaaga	agacccgatg	tttagcccg	atatggagga	tatttttacc	720
cgcgcgcaac	aggatggtg	gattccaggt	gacgcccagg	cgattgccgg	aacctggtcg	780
accttttctg	aaagcgggtga	ggctttccag	atgaatatgg	tgtacgcctt	tggttttgac	840
tgtaccgatg	tcttcgat	aaccaaagct	gagattgccg	gaaggcagca	agcattatgg	900
gcaattgacg	cactacgcca	ctatgttccg	ggctttgaaa	atgtacggtt	acgcaatttt	960
ggtgccacgc	tggggacgcg	tgaatcacgg	cttattgag	gggaaatacg	tattgctgat	1020
gattacgtcc	ttaatcagg	gcgttggttcg	gacagtgtag	ggattttccc	ggaattttat	1080
gatggttccg	gttatctcat	tttgccaacg	accgggcggt	tctttcagat	cccttatggt	1140
tgtctggtgc	cgaaaaaagt	ggagaacctt	ttggtgccg	gtcgtgtat	ttccgcaggc	1200
gtagtgtcac	atacttctat	gcgtaacatg	atgtgttgtg	ccgttaccgg	tgaggccgca	1260
ggtactgccg	ccgtggtttc	gctacagcaa	aattgcaccg	tgcgtcaggt	tgctatccct	1320
gatttgcaaa	acacgctgca	acagcagggc	gttcgtctgg	ca		1362

<210> 77  
 <211> 759  
 <212> DNA  
 <213> Escherichia coli

<400> 77						
atgtctgcc	aaagacgact	tcttattg	tgtagcttga	taacagctat	ctatcatttt	60
cctgcatatt	cttcattaga	atataaagga	acctttggtt	caataaatgc	gggttatgca	120
gactggaaca	gtggattt	aaacactcac	cgtggtgaag	tatggaaagt	gactgcggat	180
tttggggtaa	attttaaga	agcagaattt	tactcatttt	atgaaagtaa	tgtagtcaat	240
catgctgtag	cagggagaaa	tcatacggtt	tcagcaatga	cgcagtgcag	actctttgac	300
tctgatatga	cattcttttg	caaaatttat	ggccaatggg	ataactcatg	gggtgacgat	360
ctggacatgt	tttatggatt	cggttacctc	ggctggaacg	gcgagtgggg	cttttttaaa	420
ccgtatatgt	gattgcataa	tcaatctggt	gactacgtat	cagctaaata	tggtcaaacg	480
aatggttgga	atggttatgt	tggtggctgg	acagcagtat	taccatttac	gttatttgac	540
gaaaaatttg	ttttatctaa	ctggaatgaa	atagaactgg	acaggaacga	tgcttacacg	600
gagcagcaat	ttggccggaa	cggtttaa	ggcggtttaa	ctattgcctg	gaagtcttat	660
cctcgtgga	aagcaagtgt	gacgtggcgt	tatttcgata	ataagctggg	ctacgatggc	720

tttggcgatc aaatgattta tatgcttggc tatgatttc

759

<210> 78

<211> 1476

<212> DNA

<213> Escherichia coli

<400> 78

atggccagtt tgcacggcct tgcagtttgc acagggaatg cttttagtcc tgccttagcc	60
gcagaggcta aacaacctaa tttagtcatt attatggcgg atgatttagg ttatggcgat	120
ttagcaacat atgggtcatca gatcgttaaa acacctataa tcgacaggct tgcacaggaa	180
ggggtcaaat ttactgacta ctatgcccc gtccttttaa gttcaccttc acgcgcaggg	240
ctattaaccg gccggatgcc atttcgtact ggaattcgct catggattcc ttacggcaaa	300
gatgttgctt tagggcgtaa cgaactcacg attgctaact tactcaaaag gcaagggtac	360
gacacggcaa tgatgggtaa gctgcattct aatgcaggcg gcgatcgcac cgatcagcca	420
caagcacaag atatgggctt tgattactca ctggctaata cggcgggctt tgttaccgac	480
gccacgctgg ataacgctaa agaacgcccc cgttatggga tggttttacc gacagcgctg	540
ctacgtaatg ggcaaccac tccacgagcc gataaaaata gcggtgagta tgtcagttcg	600
gaagtctgca actggctgga taacaaaaag gacagcaagc ctttcttctc ctatgttgct	660
tttaccgaag tgcatagccc cctggcttcg ccaaaaaaat acctcgacat gtactcacia	720
tatatgacg cgatcagaa gcagcatcct gatttatatt atggcgactg ggcagacaaa	780
ccctggcgtg gtgtggggga atattatgcc aatatcagct atctggatgc acaggttgga	840
aaagtctggt ataaaaatca agcgatgggt gaagaagata acacaactgt tatttttacc	900
agtataacg gtccggtaac gcgtgaagcg cgcaaatgt atgagctgaa tttggcaggg	960
gaaacggtg gattacgcg tcgcaaggat aacctttggg aaggcggaat tcgtgttcca	1020
gccattatta aatatggtaa acatctacca cagggaatgg tttcagatac acccgtttat	1080
ggtctggact ggatgcctac tttagcgaaa atgatgaact tcaaatacc tacagaccgt	1140
actttcgatg gtgaatcgct ggttcctgtt cttgagcaaa aagcattgaa acgcgaaaag	1200
ccattaattt tcgggattga tatgccattc caggatgatc caaccgatga atgggcgatc	1260
cgtgatggtg actggaagat gattatcgat cgcaataata aaccgaaata tctctacaat	1320
ctgaaatctg atcgttatga aacacttaac ctgatcggtg aaaaaccaga tattgaaaaa	1380
cagatgtatg gtaagttttt aaaatataaa actgatattg ataatgattc tctaataaaa	1440

gccagaggtg ataaaccaga agcggtagacc tggggc

1476

<210> 79  
<211> 954  
<212> DNA  
<213> Escherichia coli

<400> 79

gtgacaacaa ctatctgcgc tatgggcgaa ttgctggccg agtttttgtc ccgcaaccca	60
catcaaaaat tcaactcagcc tggggagttt atcggggccat ttcccagcgg tgcgccagca	120
atttttgctg ctccaggtggc aaaactgtcc catcgggcca tcttctttgg atgtgttggt	180
aatgatgatt ttgcccgact cattatagag cgtctccgtc atgaaggtgt cattaccgat	240
gggatccatg ttatgaacaa tgccgtcaca ggtacggcgt tcgtgagtta tcaaaatccc	300
cagcagcggg atttcgtctt taatatccct aacagcgcct gcggtttgtt tactgccgag	360
cacattgata aggatctgct taaacagtgt aaccatctgc atattgtggg ctcatcgttg	420
ttctcatttc gcatgatcga tgtcatgcgt aaagcaataa cgacgatcaa atcggtctggc	480
ggcacccgtt ctttcgatcc caatattcgc aaagagatgc tgagcattcc tgaatggcg	540
caggctctcg attatttgat tgaatatagc gatattttta tccccagcga aagcgaactc	600
cctttcttcg cgcgtcacia aaatctgtca gaggaacaga ttgttagcga tcttctccac	660
ggcggcgtaa aacatgtggc gataaaacgc gccacgcgtg gggccagcta ttacaagctt	720
aaaaacggta cattacacgc ccagcatggt gcaggtcacg atatcgaaat tatcgatcca	780
acgggtgcag gcgactgctt tggcgcaacg tttatcactc ttttcttacc cggtttcccg	840
gcacacaagg cgctgcaata tgcaaatgcc agcggcgcgc tcgccgtaat gcggcaaggt	900
ccgatggaag ggatattctc actggcagac attgaagact ttttgacga gcac	954

<210> 80  
<211> 513  
<212> DNA  
<213> Escherichia coli

<400> 80

atgaagatat tcattagttt atttttgttt ataatatcaa caaattcttt tgctgatgat	60
atcactcatg ccggagtggt tcgtattgaa gggtaatta ccgaaaaaac ctgcattatt	120
tctgatgagt caaaaaattt tacagttaat atgccagacg taccagtagg ttcgtaagg	180

agtcgagggg atgttactga aaaggtttat tttccataa cgtaaccg ctgtggtagt	240
gatgttgga acgcgtatat aaagtttacc ggcaatacag tttctgaaga tgccagttta	300
tataagctgg aagatggcto ggtagagggg cttgcactta cgatttttga taagaacaaa	360
ggcagtatta gtaatgatgt taaaagcatg gttttttcac ttacatcatc agttgataat	420
atattgcatt tttttgcggc ttacaaagca ttaaaaaata atgtccaacc aggggatgca	480
aatgcgtcag tatcgtttat tgtcacctat gat	513

<210> 81  
 <211> 603  
 <212> DNA  
 <213> Escherichia coli

<400> 81	
atgattaaat tccggcttta tattccccct gtaattctcg gttttgttat cgtaccatta	60
ttggtatggc cgacggttat tgccttagcc gtacttatat tcacgttaac tttctggcg	120
gaaataatat tctcctttcc gctcctggtt gtgcgtattt ctcttcagga attacaactt	180
gagttatttg ttgtatatgc acttttttcc agtgtaatgg gtggcatcgg ttggcaattc	240
tcccgcagaa cgcctctcga attaaaaaac aggcctacatt gctggctggt ttttctccg	300
gtctatttct ggttaattct ctcgaaattc attctttata tttctcaga gaaatcagcg	360
ttgctggaaa atatccgaaa tttctttctg acatttgtct ggcttcccc gaatttttcc	420
cctttttggc cgcagccgtg gactgatatt gtccggccga ttagtgccca gcttggtttt	480
gcgttgggat attattgcca gtggcgtagc aaaaatagaa gccataggaa gaagtggggc	540
gattgggtaa cgtgcttaag tttggcgatt ttagctctgg gccggttatt caattattta	600
caa	603

<210> 82  
 <211> 702  
 <212> DNA  
 <213> Escherichia coli

<400> 82	
atgaaattca atttatctaa tttatccgca gtattactgg catcaggtat gctgatgtct	60
actgcggtaa ccgcagcacc cggcgtatga acacaatttg gtggggcgga tactgactgg	120
agcaccgttg attatcccga gctcactgat atggatgaca acgttgattc aatggggggg	180
aaaatccgct ttactggccg ttagtgaaa gctacctgta aggtcgcaac cgattcaaaa	240

cagattgaag ttgtctgcc ggttgtgcct tccaaccttt tcaactggtat cgacgtagaa	300
gcacaggggg cgagcaacca gaccgatttc aatattaatc tgaccgaatg tagcaataca	360
gatgatcaga aaattgagtt ccgttttacc ggtactgcag atagcgctaa taaaacgctc	420
gctaacgaag tagaaggatc aacggatgct gacaacagcg gcaatgcggg ggcgactggg	480
gtagggtatt gaatttactc caaaggtagc acgaataatg gtctgattaa cctgaatacc	540
actgcggcag agggtagcgc ctccaccgcc gcttatacaa ttccaggaaa tgctacgacc	600
catgatttca gcgcggcctt tactgcaggt tatgtctaaa acggtagcac tgttgcacca	660
ggtgtagtta agtcaacagc aagttttgtt gtgctgtacg ag	702

<210> 83  
 <211> 1008  
 <212> DNA  
 <213> Escherichia coli

<400> 83	
atgcgtatac atactttattg gtatagaaga tttttcattt tattgattat tatattttca	60
aatgttcttt cttctattgc taatgctgaa gatatggggc gagaacgtgc atattgttat	120
ccgggttcac cgagtaataa tactacgcct gcatcctttt cttataattt tgggtactata	180
gtggtttctg atgtcaacaa aaatgcgcct ggcaactgtat tgccatcaca aatctggaag	240
gttggaacct ataaggctta ttgtaattct cttgatgatt atgaaattta cttcagtget	300
gtctctggaa tagatccgtc tgggtccagt ggtgatcatc aagggagtga tgtattttatt	360
ccactcacc c atgaaatata tgtctctact catataaaac tttataatca aaatggcaca	420
atgacagata aaattgtgcc attcgaaaat tataatacca attatccggg ggacagaagc	480
aaaccatcta attgggcatac aggtactgaa ggatatatta aaatcaggat tgataaaaaa	540
attatatctg atgtttcatt aagtaacgta ttattggtgt cattatatgt cagccagatc	600
cctaccgaac atggtcctat ccctgtcttt aatgcctaca taggaaactt aaatattcag	660
gttccgcaag gttgcactat taatgagggg acgagtttta ctgttaatat gccgatgtg	720
tgggccagtg aattgagccg ggctgggtgcc ggagcgaagc ccgctggtgt tactcctgta	780
gcaacaacta ttccgattaa ttgtacgaat aaagatacag atgcggtaat gacgttggtta	840
ttcgacggtg acattttccg cacacgtgat accaatggga aacaaagtat tattcaggca	900
caagataatc ctgatgttgg tattatgatt atggatagtc agcaaaactc cgtagattta	960



aatgccctgg caacatcagt aggcgttccg ttcagattgg tggaaaac 1008

<210> 84  
<211> 2592  
<212> DNA  
<213> Escherichia coli

<400> 84

atgaacctaa agctcaaaaag atgcgaatat tggatggcgg cacaaaagca gatgaaacgg 60  
gttgtgcgc tctctctggt tattatgcct gcatgttcaa tcgcgggaat gcgctttaac 120  
cctgcttttc tgtcgggtga tactgaagct gttgctgact tatcccgctt cgagaaaggg 180  
atgacttata tctctggtag ctatgaagtc gaagtttggg tcaatgattc ccctttactc 240  
tctcgtactg taactttttaa agcagacgat gagaatcaac tgattccctg cctttcactt 300  
gctgacttat taagccttgg aattaacaaa aatgcgctgc cagagcaggc ttggccttca 360  
tctgaaaata gttgccttga tttgcgtatc tggtttcccg atgtgcatta catgccggag 420  
ctggatgcac agagacttaa actgaccttt ccacaggcga taataaaacg tgacgctcgc 480  
ggatatattc caccagaaca gtgggataac ggtattacag cttttttgct gaattatgac 540  
ttttctggtg ataacgatcg tggtgattac tcttcaaata actattattt aaatcttcgc 600  
gctgggatca atattggtgc atggcgtttt cgcgattatt caacctggag tcgtggggagt 660  
  
aatcagcag gtaaaactgga gcatatcagt agtacgttgc agcgcgttat tattcccttc 720  
agaagtgaat taacgctagg agatacatgg tcatcatcag atgttttcga cagtgttagt 780  
attcgtggca taaaactgga atctgacgaa aatatgttgc ccgatagta aagtggtttc 840  
gctccacgg tgcgcggaat tgcgaaaagt cgcgctcagg taacaatcaa acagaatggt 900  
tatgtcattt atcaaaccta tatgccgcgc ggaccgtttg agattagcga tcttaaccog 960  
acatcatctg cgggagatct ggaagttacc atcaaagagt ctgataattc agaaactgtc 1020  
tataccgtac cttatgcgcg tgtccccatc ctgcaacgag aaggtcattt aaaatattct 1080  
actacggttg gccaatatcg aagcaatagc tataaccaga aaagtcctta tgtatttcag 1140  
ggggaattaa tttggggttt accctgggat attacggctt atgggtggggc acaattctct 1200  
gaggattacc gggcgttggc gctcggcctt ggcctgaatc tgggtgtatt tggtgcaaca 1260  
tcgtttgatg ttactcaggc taacagtctg cttgtggatg ggagcaaca tcaagggcaa 1320  
tcttatcggt tcttttatto caaatcggtt gttcagacag gaacagcatt ccatattatt 1380

ggctatcgtt attcaaccca gggcttttac actttaagtg atacgacata ccaacaaatg	1440
tcagggactg ttgttgatcc aaaacggtta gatgataaa attacgttta taactggaat	1500
gatttttata acttgcgtta tagcaaacgt ggaaaatttc aggcgtatgt atcgcaacct	1560
ttcggtaact acgggtctat gtatttatcg gctagtcagc aaacatactg gaatactgat	1620
aaaaaagatt ctttatacca agttggttat aacaccagta ttaagggtat ctatctaaat	1680
gttgcgtgga attacagtaa atcaccaggg acaaatgcgg ataaaattgt ctgcgtaaat	1740
gtctcattac ctataagtaa ttggttatct tccacgaatg atgggcgctc atcatcgaat	1800
gccatgactg caacgtatgg ttatagtcag gataaccacg gacaggtaaa ccaatatacg	1860
ggggtatctg gttctctgtt ggagcagcat aatctcagtt ataacataca acatggtttt	1920
gctaatacagg ataatagcag tagtggttct gttggtgta attatcgtgg gccatatggt	1980
tccttgaatt ccgcctacag ttacgataat gaaggtaatc aacaaataaa ctatggcatc	2040
agtggtgctc ttgtgtgaca tgaaaatggt cttacgttga gtcaaccatt agtgaaact	2100
aatgttttga taaaagcgcc tggagcgaat aatgtggatg ttcagcgggg gacaggaata	2160
tcactgact ggcgtggata tgcagttgtt cttatgcaa cagaatatag acgtaataat	2220
atttcattag atcctatgtc aatgaatatg catactgaac tggatatcac ttccactgaa	2280
gttattccgg gaaaaggtgc gttagttcgt gcagagtttg ctgctcatat cggtatctgt	2340
ggtttgttca cagttcgta tcgtaataaa tcagtcacct tcggtgctac agccagcgct	2400
cagattaaaa acagtagtca aattaccggg attgtcggcg ataattgaca actttatctc	2460
tcaggattgc ctttagaagg tgttattaat atccagtggg gagacgggtg tcagcaaaaa	2520
tgtcaggcta attacaagct ccctgaaaca gaactggata atcctgttag ctatgcaact	2580
ctggagtgcc gc	2592

<210> 85  
 <211> 507  
 <212> DNA  
 <213> *Escherichia coli*

<400> 85	
atgggagcga tttatgttaa acgtttgatt ctgtcggtag cactgataat accgatagca	60
tccaatgctt ctgatgcttt gaaccagccg agcagtagtc taaatgatgg tgttgagact	120
ttttttatct cctgctttga tatgcctcag gaaacaacta ctgatattga cgcttgctag	180
agagttcagt tagctcagggt tagttgggtt aagaataagt attcgggtggc cgccctgaat	240

cgtttgaaac aagacaacaa ggatgatcca cagcgtctgc aggaattaac tgcttctttt	300
aacgcggaag gtgaagcttg gacagaatta attgagaaag cgtcaaagtc cgtccagggt	360
gattatgtag gaggaactat agctggcact gcagttgcat caggtcaaat tggcttcttg	420
gaattacaat cccacgatat ctgggagcac tggctacgat ctgcaggact caactcctcc	480
tcttttgcca gaaccaaagt tcaaatc	507

<210> 86  
 <211> 2139  
 <212> DNA  
 <213> *Escherichia coli*

<400> 86	
atggctatgt tcacaccttc attctcagga ctcaaaggtc gggcgctctt ttactgctt	60
tttgccgac cgatgattca tgcaacagac tctgtaacga ccaagatgg cgaacaacac	120
actgttacag cagatgcaaa taccgcaact gaggcaaccg atgggtatca acctctgagc	180
acctccacgg cgacattaac cgatatgccg atgctggata tccgcagggt ggtcaatacg	240
gttagcgatc aggttctgga aaaccagaat gcgacaacgc tggatgaggc gctttataac	300
gtcagtaacg tggtagacag caatacatta ggcggggactc aggatgcttt tgtacgccgt	360
gggtttggcg caaacgggga tggctccatc atgaccaacg gtctcgcaac cgtacttctc	420
cgtagtttca acgccgcaac agagcgtgtg gaagtgctaa aaggcccgcc ctccacgctg	480
tatggcattc tcgatcctgg cggactgatt aacgtcgtga ccaagcgccc ggaaaaaaca	540
ttccatgggt cggtttcagc cacctcctcc agttttgggt gcggcactgg gcaacttgat	600
atcacaggtc ccattgaagg cactcagctg gcgtatgcc ttaccgggga agtcaggat	660
gaagattact ggcgaaactt cggtaagag cgagtagcat ttattgcccc gtactcacc	720
tgggtttggtg ataatacga agtaaacatg ctctattccc atcgggacta taaaactcca	780
ttcgatcgtg gaacgatttt cgaccttacg acgaaacagc ccgtaaacgt tgatcgaaaa	840
atagcttttg acgaaccggt taatattaca gatggtcagt ccgatctggc gcaactcaac	900
gcagaatata atctcaatag ccagtggaca gcgcgcttg attacagta cagccaggat	960
aaatacagcg ataatacagg cgtgtttacc gcgtatgatg caacgacagg aacctgaca	1020
cggcgtgttg atgcaactca gggatctacc cagcgtatgc atgctactcg tgcggatctg	1080
caagggaatg ttgatattgc cggattctat aatgagattc tgggtgggtg gtcatatgaa	1140

tattatgata	tcttgcgtac	agatatgatt	cgctgtaaaa	aagctaaaga	tttcaatata	1200
tacaacccgt	tttatggtaa	taccagcaaa	tgtacaacgg	tttcggcgct	ggacagcgat	1260
cagacgatca	aacaggagaa	ctactcagct	tatgcacagg	acgcgctcta	tctgaccgat	1320
aactggattg	ccgtgcgcgg	gatccgctat	cagtattaca	cgcaatatgc	gggtaaaggc	1380
cgctccttta	atgtcaatac	tgacagccgc	gatgaacaat	ggacgcccac	actgggggta	1440
gtctacaaac	tgacgccatc	ggtatcccta	tttgccaatt	attcgcaaac	atttatgcgc	1500
cagtcgtcaa	ttgccagcta	cattggcgat	cttcaccacg	aatcatctaa	tgcttacgaa	1560
gtcggggcaa	aattcgagct	attcgatggt	atcacgcgag	atattgcgct	gtttgatata	1620
cataaacgta	atgtgttgta	taccgaaagt	attggtgatg	aaaccatcgc	caaacaggca	1680
ggcgcgcttc	gttcaagagg	ggtagaagtc	gaccttgctg	gagcattaac	tgaaaacatt	1740
aatatcattg	ccagctactg	ctataccgat	gcaaaggctc	tggaagatcc	tgattatgca	1800
gggaaaccat	tgccgaatgt	tcctcgtcat	accggttcgc	tattcctgac	ctatgatatt	1860
cataacatgc	caggcaataa	cacactgacg	tttggcgggt	gcgacatcgg	tgtaagccgt	1920
cgcttcggcaa	ccaatggggc	tgactattat	ctgcctggct	atttcgttgc	cgatgccttc	1980
gccgcataca	aaatgaaatt	gcagtatccg	gtcactctgc	aattaaacgt	caaaaacctg	2040
tttgataaaa	cgtattacac	ctcttccatc	gccacaaata	atctggggcaa	ccagattggc	2100
gatccgcgtg	aagtgaatt	cacggtgaaa	atggaattt			2139

<210> 87  
 <211> 1818  
 <212> DNA  
 <213> Escherichia coli

atgaaaatat	cgtggaatta	tatatttaag	aacaaatggc	gatttcacat	tacaagcatt	60
tcactttttc	ttatcatgct	cgcgggttca	atcgcttttt	tgcaacttgc	ttttaatacc	120
ttgtccagta	ccgataaaat	gcggcttgaa	atgtataagt	ccacattata	ttccaccatc	180
gagcaatttt	atgtttttacc	ctatatgctc	tcaacagacc	atatcatccg	tcaggcggtg	240
attacgcctg	acgatatgac	gtccagcgaa	ctcaatcaac	gaattgcaca	tttcaatact	300
caactcaaaa	ccgcagcaat	atttattctg	gatacccaag	gtaaggccat	cgcttctagc	360
aactggcagg	ccccggcgag	ctatgtaggg	caaaattata	gctatcgccc	ctattataaa	420
cacgccatgt	ctggcttaaa	tggacgcttt	tacgggtattg	gtagcactac	gaatacaccc	480

ggattcttcc tctctacaag tataaaagat aaaggaaaaa ttgtcgggtg tgtagtagta	540
aaaataagtc ttaatgaaat tgaaaaagca tgggccgaag gtcctgaaaa tattatcgtg	600
aatgatgaac atgggattat atttttaagt tcaaaatcgc catggcgaat gcgaacctg	660
caaccgttac ctgttcaggc aaaacaaaa ctacaatcta cccgccaaata tagtctcgac	720
aatcttttac cggcggatta ttatccctgt tataccgtga gcaattttac tttctgaaa	780
gataaaaaag aacaactctg tttattcccg caatattata cgcaacaaat agccattcca	840
gaatttaact ggaaaatgac aattatggtc cccttagata acctgtactg gtcatgggct	900
atttcgttag tcattacact aattattttac ctgctgtttt tgttatttat taaatactgg	960
agaatgcgat ctcatgcaca acaattatta acacttgcca atgaaacatt agaaaaacag	1020
gttaaaagc gtacatctgc cctggaattg atcaatcaaa aattaataca ggagataaaa	1080
gagcgcagtc aagctgaaca agtattacaa attacgcgta gtgaactggc agagtccagc	1140
aaactggcgg cgcttggaac gatggcaacc gaaattgccc atgaacaaaa tcaaccgtta	1200
gccgccattc acgcacttac tgataacgcg cgtactatgc taaaaaaga gatgtatccg	1260
cagggtgaac agaactctga acatattatt tcagtgattg agcggatgac gcagctcatt	1320
tccgaactta aagcatttgc ctgcgccat cgcgtaccta aaggttctgc cgatgtcatc	1380
aaagtgatgt atagcgcctg ggcgttactt aatcacagca tggagaaaaa taacattgag	1440
cgacgaataa aagcccatc catgccgtta tttgtcaatt gcgatgagct cggctctgaa	1500
cagatattca gtaatttaat tagcaacgcc ttagattcta tggaaaggtag ctcttacaaa	1560
cgactggata tcgccattcg ccaggcaaat aacaaagtta ttattacat taaagacagc	1620
ggtggcggtt ttgcacctga agttgtcgat cgcataattg aaccattttt taccactaaa	1680
cgtagaggaa tgggggttgg actggcaata gtcagcgaaa ttgtccgaaa ttcgaaacgc	1740
gcactccacg ccagtaatac tcctgaagc ggcgcagtaa tgacattaac ctggcctgaa	1800
tggggagaag aacatgaa	1818

<210> 88  
 <211> 303  
 <212> DNA  
 <213> Escherichia coli

<400> 88

gtgcttacac cacaacattt acgttggtgtg ttaacatgta gcgatttact gactcttttg	60
agtgggtaccg ttatgtctca aatgcccttc tattttctta ataccacaaa gaaactcact	120
gctcactatg aatggcttca aatcaacctg actgatactt acgaactagt taaaagggtta	180
atgccgattc cttcactgga cgtgggtggt aaagtaggga aacttgtcct cccggagaaa	240
gggcatcatg gtttttaccg tgaagctgga gttgtctata gaacagtagc tccagaaaat	300
cca	303

<210> 89  
 <211> 789  
 <212> DNA  
 <213> Escherichia coli

<400> 89	
atgatgaaaa atacaggcta tatcttagct ctttgtctga cagcatcggg gcatgtccta	60
gcccatgatg tctggattac aggtaaacag gcagagaaca acgttaccgc agagattggt	120
tatggtcata atttcccttc aaaggggaca attcctgaca gaagggattt ctttgaatat	180
ccccggcttt ataacgggaa agagacaata aactgaagc cagcgtccac ggattatgtc	240
tataaaactg agtctgcaag caaagataat ggttacgttc tgtcaacgta tatgaaaccg	300
ggatactggt cgagaacctc gtcaggatgg aaaccgggtc gccggggagg cagaaatgat	360
gtggcttact gtgaatttgt cactaaatat gcaaaatcct ttattcctgg tgaacagcag	420
atgccagcac aactctatca gtctccaaca gggcatgagc ttgaaatcat tccgttatcc	480
gatataagtc gtttcagtga aaatgtgaag ctgaaagttc tgtataaac gtccccgctc	540
gccggagcta tcatggagct tgactcggtc agttatctga catcatccgc tcatactcat	600
gcagttgagc acaaacatcc tgttcataaa gcagaactca cctttgtaac taatgaggat	660
ggtatcgtca cagtaccttc tcttcatatc ggacagtggc tggcgaaagt ccaaaataag	720
aaaagttttc aggcacaaaag cctgtgtgat gaaactgtcg atgtggcaac cttaaagcttc	780
tcccgaatat	789

<210> 90  
 <211> 1134  
 <212> DNA  
 <213> Escherichia coli

<400> 90	
atgggaaaaa taaaatatgt gctaatagta ggatttatta tactttttgc gattttttac	60

attgctatta gtagacagga ttctacgctt tctaggttga aatcagcagg tgaaacgga	120
gatgtagaag ctacagtatgc ttggggctc atgtatttgt atggagaaat tctggatgtt	180
gattatcagc aggcacaaat ttggtatgaa aaagccgctg accaaaatga tccgcgtgcg	240
caggccaaac tcggtgtgat gtatgcaaat ggtctcgagg taaatcagga ttatcagcaa	300
tcaaaattat ggtatgaaaa ggcggctgcg caaatgatg ttgatgcgcg atttttgcct	360
ggggagatgt atgacgatgg tctcgggga agccaagact accagcatgc aaagatgtgg	420
tatgaaaaag cggctgctca aaatgatgag cgtgctcagg tcaatctcgc tgttctatac	480
gcaaagggta atggtgttga acaggattat cgacaggcca aaagctggta tgaagagct	540
gcagctcaaa atagtcttga tgcgcagttc gctcttgaa ttctgtatgc caatgcta	600
ggtgtagagc aggactatca gcaggcaaaa gactggtatg agaagcagc agaacaaa	660
ttcgccaatg ctacgtttaa tcttggatg ctctattaca aaggtgaggg tgtaaacaa	720
aactttcggc aagccagaga atggtttgaa aaagccgat ctcaaatca gccgaatgcc	780
caatataatt taggtcagat ttattactac ggtcagggtg tgactcagag ctatcgacag	840
gcgaaagact ggtttgaaaa agcggcagag aaaggtcatg tcgatgctca atataatctc	900
ggtgtaatat acgaaaaatg tgaaggtgtg agtcagaact atcaacagcg aaaggcttgg	960
tatgaaaagg cagcctcaca aaatgatgcg caggcgagct tcgaacttgg cgttatgaat	1020
gaactgggtc agggtgaaag catagacctg aaacaagcaa gacattacta tgagcggta	1080
tgtaataatg ggcttaagaa aggttgtgaa cgggttaaaag agttattata caaa	1134

<210> 91  
 <211> 1962  
 <212> DNA  
 <213> Escherichia coli

<400> 91	
atgaatgtaa tcagaactgt catttgtaca ttaattatac ttccggtggg attacaggca	60
gcgaccagtc attcttctat ggttaaagat acaatcacca ttgtcgcagc aggaaatcag	120
aacacggtat ttgaaacgcc gtcgatggtc agtgtcgtca cgaatgacac accgtggagt	180
cagaatgcgg ttacatcgcc cgccatgctg aaagggtgtg ccggtctcag ccagactggt	240
gcaggacgga ccaatgggca gacctttaat ttacgcggct atgacaaaaa cggggactct	300
gttcttgttg acggcggttc ccaactcagt gcacatggca aaagcagtg cacttatctg	360

gatccggcac tgcgtcaaacg tatcgaagtt gtccgcgggc caaactccag tctgtacggc	420
agtggcgggc tgggaggtgt agtggacttc agaactgccg atgcagcaga ttttcttccc	480
cccggagaga caaacggttt aagtctgtgg ggaatatcgc ccagtgggtga ccacagcaca	540
ggctcggggc tcacctggtt tggtaaaact ggaaaaacag atgcgctcct ttctgtcatt	600
atgcgtaaaa gaggtaatat ctatcaaaagt gatgggtgagc acgcacctaa caaggaaaaa	660
cctgcagccc tgtttgcgaa aggcctctgtc ggtataacag acagtaacaa agcagggtgcc	720
agcttcgctc tctaccggaa taacaccact gaaccgggca attccactca gacacatggt	780
gacagcggcc tgcgtgacag aaaacagta caaatgacg tacagtcttg gtaccagtac	840
gctcctgtgg ataacagcct catcaatgta aagtcaacgt tatatctcag tgatatcact	900
atcaagacaa acggtcacaa caaaacggca gaatggagaa acaacagaac ctccggtggt	960
aatgttgtca acaggagtca tactctgatt tttccgggag cccatcagtt aagttatggc	1020
gctgaatatt accgtcagca gcagaagcca gaaggctctg ccacactata tccggaagga	1080
aacattgact ttacatcggt gtatttcag gatgaaatga caatgaaaa ctaccgggt	1140
aacattatcg tcggttcccg ctatgaccgg tacaagagct tcaatcccg tgcggagaa	1200
ctgaaagccg aacgcctgtc cccaagggcg gcgatttcag tctcaccgac agactggctg	1260
atgatgtacg gctccatc ctctgcattc cgagcgccca caatggcaga aatgtacagg	1320
gatgatgtac atttttaccg caagggtaaa cccaattact gggttcctaa ccttaatctg	1380
aaaccagaaa ataacatcac ccgtgagatt ggcgcaggta ttcaactgga tggcctgctt	1440
acagacaatg accgggtgca gttaaaaggc ggatatcttg gaacgggatgc cagaaactat	1500
attgccacac gcgtggatat gaaacggatg cgttcttatt cttataatgt atcccgggcc	1560
cgtatctggg gatgggatat gcagggtaat taccagtctg attatgttga ctggatgctt	1620
tcttataacc ggacggaaa tatggtgcc agcagcaggc aatggctggg ctccggcaat	1680
cctgacacac ttatcagtga catcagcata cctgttggtc atagaggcgt ttatgccgga	1740
tggcgtgctg aactttcagc atcagccacg catgtgaaaa aaggcgatcc ccatcaggct	1800
ggttatacca tacattcctt ttcactgtct tataagcctg taagtgttaa aggccttgag	1860
gcgtcagtaa ctctggataa tgccttcaac aagcttgcca tgaatggcaa aggtgtgccg	1920
ctttcaggca gaactgtcag tctttatacc cgttatcagt gg	1962



<212> DNA  
<213> Escherichia coli

<400> 92

atgaataaaa tatacgctct aaaatatgt tatattacta acacagtaaa ggttgctctc	60
gaactagccc gaagggtagt taaagggagt acccgagag gaaaaagact ttcagtactt	120
acctctctgg cactatctgc attactocca accgttgctg gtgcatcaac ggttggtggc	180
aacaatcctt accagacata ccgcgacttt gcagaaaaa aagggcagtt tcaggctggc	240
gcaaaaaa ttcctathtt taataataaa ggggaattag taggacatct tgataaagcg	300
cccatggttg atttttagcag tgtgaatgta agctcaaato ccggcgttgc aacattaatt	360
aacccgcaat atatagccag tgtaaaacat aataaaggat atcagagcgt cagcttcggt	420
gatggtcaga acagttacca tattgtggat cgtaatgaac acagttcatc tgatctccac	480
acaccaagac ttgataagct cgtaactgag gttgctccgg ctaccgtaac cagctcatca	540
acagctgata tattgaaccc ttcaaaatac tcggcattct acagggctgg ttcgggaagt	600
cagtatatct aggatagtca gggtaagcga cattgggtta caggtgggta tggttatctg	660
acaggaggaa tactcccgac atcattcttt tatcaccgct cagacggcat tcagctgtat	720
atgggggggc acatacatga tcatagcctc ctgccctctt ttggagaggg cggcgacagt	780
ggttctccat tattttgctg gaatacggcc aaagggcagt gggaaactggt cgggtgttac	840
tcggggagtag gaggggggac caatttgata tattctctta ttctctcagag tttctctca	900
cagatctatt cagaggataa tgacgctccc gtctttttta atgcctcatc cggcgccccc	960
ctgcaatgga aatttgacag cagcaccggc actggctctc tgaacacagg ttccgatgaa	1020
tatgccatgc acgggcaaaa aggttctgac ctgaacgcag gtaaaatct gacattctg	1080
ggacataatg gtcagattga cctggaaaac tctgtcacgc aggggtccgg ttcactgaca	1140
tttactgatg actacactgt caccacttca aacggaagta cctggaccgg gccgggtatt	1200
attgtggaca aggatgccto cgtaaaactg caggttaatg gtgtgaaagg tgacaacctg	1260
cataaaatcg gcgaaggaa cctggttgta cagggaacgg gtgttaatga gggcggcctg	1320
aaagtcgggg atgggacctg tgtcctcaat cagcaggctg acagttcagg acacgttcag	1380
gcattcagta gcgtgaatat tgccagcggc cgcccgacag tcgtgctggc agacaaccag	1440
caggttaatc cggacaatat atcctggggc taccgggggg gggttctgga tgttaacggg	1500
aatgacctga catttcaata gctgaatgcc gccgattatg gcgcaactct cggttaacagc	1560

agtataaaa	cggtctaata	tactctggat	tatcagacgc	gtccggcaga	cgtaaaagt	1620
aatgaatgt	catcatcaaa	caggggaaca	gtaggttcat	tatatattta	taataatccc	1680
tataactcata	cgctcgatta	ttttatcctg	aaaacaagta	gttatggctg	gttccctacc	1740
ggtcaggtca	gtaacgagca	ctgggaatat	gtcggacatg	accagaacag	tgacacaggca	1800
ctgcttgcaa	acagaattaa	taataaagg	tatctgtatc	atggcaagtt	gctgggaaat	1860
attaatttct	caataaaagc	aaccccggt	acaaccggcg	cattggttat	ggacggctca	1920
gcgaatatgt	ccggtacatt	tactcaggaa	aacggctcgt	tgaccattca	gggccaccgc	1980
gttatccatg	cttcaacgtc	tcagagtatt	gcaaatacag	tctcgtctct	ggcgacaat	2040
tccgttctga	cacagccac	ctcatttaca	caggatgact	gggagaacag	gacgttcacg	2100
tttggttcgc	tcgtgtttaa	agatacagac	tttggctcgt	gccgaatgc	cacactgaac	2160
acaaccatcc	aggcagataa	ctccagcgtc	acgctggcg	acagtcgggt	atttatcgac	2220
aaaaaagatg	gccagggaac	agcatttacc	cttgaagaag	gcacatctgt	tgcaactaaa	2280
gatgcagata	aaagcgtctt	caacggcacc	gtcaacctgg	ataatcagtc	agtgtgaat	2340
atcaatgaga	tattcaatgg	cggaatacag	gcgaacaaca	gtaccgtgaa	tatctcctca	2400
gacagtgcg	ttctggagaa	ctcaacgctg	accagtaccg	cctgaatct	gaacaaggga	2460
gcaaatgttc	tgccagtcga	gagttttgtt	tctgacggtc	cggtgaatat	ttctgatgcc	2520
accctgagtc	tgaacagccg	tcctgatgag	gtatctcaca	cacttttacc	tgatatagat	2580
tatgccggtt	catggaacct	gaaggagac	gatgcccgcc	tgaacgtggg	gccgtacagt	2640
atgttgtcga	gtaatatcaa	tggtcaggat	aaagggaactg	tcacctcgg	aggggaagg	2700
gaactgagtc	ctgacctgac	tcttcagaat	cagatgttgt	acagcctgtt	taacgggtac	2760
cgcaatacct	ggagcgggag	cctgaatgca	ccggatgccca	ccgtcagcat	gacagacacc	2820
cagtggctga	tgaacggaaa	ctccacggca	ggaaatatga	aacttaaccg	gacaatatgc	2880
ggttttaacg	ggggaacatc	atcgttcacg	acactgacaa	cagataatct	ggacgcggtt	2940
cagtcagcat	ttgtcatcgc	tacagacctt	aaacaaggcag	acaaactggt	gataaacaag	3000
tcggcaacag	gtcatgacaa	cagcatctgg	gttaacttcc	tgaaaaaacc	ctctgacaag	3060
gacacgcttg	atattccact	ggtcagcgca	cctgaagcga	cagctgataa	tctgttcagg	3120
gcataaacac	gggttgtggg	attcagtgat	gtcaccacca	cccttagtgt	gagaaaagag	3180
gacgggaaaa	aagagtgggt	cctcgatggt	taccaggttg	cacgtaacga	cgccagggt	3240
aaggctgccg	ccacattcat	gcacatcagc	tataacaact	tcactactga	agttaacaac	3300

ctgaacaaac	gcattggcgga	tttgagggat	attaacggcg	aagccggtag	gtgggtgcgt	3360
ctgctgaacg	gttcgggctc	tgctgatggc	ggtttctactg	accactatac	cctgctgcag	3420
atgggggctg	accgtaagca	cgaactggga	agtatggacc	tgtttaccgg	cgtgatggcc	3480
acctacactg	acacagatgc	gtcagcaggc	ctgtacagcg	gtaaaacaaa	atcatggggg	3540
gggtggtttc	atgccagatg	tctgttcggg	tccggcgctt	actttgattt	gattgccaac	3600
tatatccaca	atgaaaacaa	atatgacctg	aactttgccg	gagctggtaa	acagaacttc	3660
cgcagccatt	cactgtatgc	aggtgcagaa	gtcgataacc	gttatcatct	gacagatacg	3720
acgtttgttg	aacctcaggc	ggaactggtc	tggggaagac	tcagggccca	aacatttaac	3780
tggaacgaca	gtggaatgga	tgtctcaatg	cgctgtaaca	gcgttaatcc	tctggtaggc	3840
agaaccggcg	ttgtttccgg	taaaaccttc	agtggtaagg	actggagtct	gacagcccg	3900
gccggcctgc	attatgatgt	cgatctgacg	gacagtgtct	acgttcacct	gaaggatgca	3960
gcggggagaac	atcagattaa	tggcagaaaa	gacggctcgt	tgctttacgg	tggtgggtta	4020
aatgcccggt	ttggcgacaa	tacgcgtctg	gggctggaag	ttgaacgctc	tgcatctcgg	4080
aaatacaaca	cagatgatgc	gataaacgct	aattatcggt	attcattc		4128

<210> 93  
 <211> 1047  
 <212> DNA  
 <213> Escherichia coli

<400> 93						
atgattacac	tttttcgact	actggcgatt	ctttgccttt	tttttaacct	ttcagctttt	60
gctgttgatt	gctatcagga	tgggtacaga	ggaacaaccc	tcataaatgg	agatttacca	120
acgttcaaaa	ttccagagaa	tgcgcaacct	gggcaaaaaa	tttgggagag	cggagatatt	180
aatatcacag	tttattgtga	caatgcacca	ggatggtcaa	gtaataaccc	atcagaaaaat	240
gtctatgcct	ggatcaaatt	gccccaaata	aatagtgccg	atatgttgaa	taatccgtat	300
ttaacatttg	gcgtgactta	taatgggtga	gattatgaag	ggacaaatga	aaaaattgat	360
actcatgcgt	gcctggataa	atatgaacaa	tactataatg	ggtattatca	tgaccctgta	420
tgcaatggca	gcactcttca	aaaaaatgta	acatttaacg	cccattttcg	cgcttatgta	480
aaattcaaaa	gccgcccgcg	aggagatcag	acggtaaaact	ttggcacagt	caacgtgcgt	540
caattcgacg	gtgaaggcgg	ggcgcaacatg	gcccccaacg	cgaaaaattt	acgctatgcg	600

attacggggt tagataatat ttcattcctt gactgtagtg tgcagctccg catttccccg	660
gaaagtccga tagtcaattt tgggcagatc gctgcgaatt ccattgcaac ttcccccgcg	720
aaggcagcat tcagcgtttc taccataaaa gacattgcgt ctgattgtac cgaacagttt	780
gatgttgcaa ccagttttctt tacttcagat acatttatatg acaatacgcg tctggaaata	840
ggtaacggct tgctcatgcg aattactgat caaaaaacgc aagaagatat taaatttaac	900
cagttcaaat tatttagtac ttatatccc ggtcagagtgc cgcaatggc aaccgcgat	960
taccaggccg aattaaccca aaaacctggt gaaccactcg tctatggccc atttcagaaa	1020
gacctgatag ttaaaatcaa ctaccac	1047

<210> 94  
 <211> 2520  
 <212> DNA  
 <213> Escherichia coli

<400> 94	
atgaacaata aaaacacggt ttcccggtat aagttatccc atgcaattaa aaatgccctg	60
tctggcggtg tgtgttccct actcttcgtt ttgcccagtc acgccgtaga attcaacgtc	120
gatatgattg acgcagaaga ccgtgagaat atcgacatct ctcgtttttg gaaaaaggc	180
tatatcccc ctggtagata cctcgttcgt gtgcaataa ataaaaatat gttgccacaa	240
acgttaatac tggaatgggt aaaagccgat aatgaaagtg gttcgttact ctgcttaacc	300
aaagaaaatt tgactaattt cggctttaat acggaattta ttgaatcatt gcaaaacata	360
gctggcagcg aatgtctcga tttaaagccaa cgtcaggagt taacgacacg acttgataaa	420
gctacgatga tattatcgct aagtgttccc caggcatggt taaaatacca ggcaacaaac	480
tggacgccac cagagttttg ggataccggt atcaccgggt ttatccttga ttacaacgtg	540
tacgccagcc agtatgcccc acatcacgga gacagcacc aaaacgtcag ctccatggt	600
acgttaggct ttaacctcgg cgcattggcg ttacgtagcg attaccaata taatcagaat	660
tttctgatg gacgctcggt aaaccgcgac agcgaatttg cgcgaactta tctgtttcgc	720
cctatcccct cctggtcgtc aaaattcact atgggccagt acgacctgag ctccaatctt	780
tacgatacct tccactttac tggcgcatcg ctggaaagtg atgaaagcat gctgcgcgca	840
gatttacagg gttatgcgcc acaaaattacc ggcacgcgc agaccaacgc gaaagtaact	900
gtggcacaaa atggctgtgt actttatcaa accactgtcg cgccaggccc ttttactatt	960
tctgatttgg ggcaatcgtt tcaggggcag ctggatgtca cagtgaaga agaagatggc	1020

cgaccagca	ccttcaggt	tggctccgca	tccattccct	atttaaccg	taaagggcaa	1080
gtgcgtata	aaacgtcact	gggaaaaccg	acatccgtcg	ggcataacga	tatcaataat	1140
ccctttttct	ggacggcgga	agcctcctgg	ggctggctga	acaatgtgtc	gttgatgggt	1200
ggtagcatgt	tcaccgctga	tgattatcag	gctatcaacta	ccggtattgg	ctttaacctt	1260
aaccaattcg	gttcgcttct	ttttgatgtc	actggagcag	acgcgtcttt	acagcaacaa	1320
aatagcgga	atctgcgtgg	ttacagctat	cgcttcaact	atgcaaagca	tttcgaatcg	1380
acaggcagtc	agattacctt	cgcggttat	cgcttctcag	ataaagatta	cggtgcgatg	1440
agtgagtacc	tcagctcgcg	taatggcgat	gagtcaatcg	ataatgaaaa	agagagtatt	1500
gtcatttcc	tgaaccagta	ctttgaaacg	ctggaattaa	actcttatct	caacgttaca	1560
cgcaactct	attgggacag	cgccagcaat	accaactact	ccgtatctgt	aagcaaaaac	1620
tttgatattg	gcgatttcaa	aggtatatct	gcacgcgtgg	cagtaagtcg	aatccgctgg	1680
gatgacgacg	aagagaatca	atattacttc	tctttctctc	tacctttaca	acaaaaccgc	1740
aacatctcct	acagtatgca	gcgaacggga	agcagtaata	cttcgcagat	gatttcctgg	1800
tacgattcat	cagatcgcaa	caatatctgg	aatatttcag	cgtcggcaac	ggacgacaat	1860
atacgtgatg	gcgaaccaac	actgcgcggc	agctaccagc	actattcgcc	gtggggacgc	1920
ctgaacatta	atggcagtg	acagccgaat	cagtacaatt	ctgttaccgc	aggctggtac	1980
ggttcaacta	ccgtacacg	tcattggtgtc	gcccttcacg	attatagcta	tggcgataac	2040
gccgcgatga	tggtcgatac	cgatggcctc	tcgggcattg	aatcaactc	taaccgtacc	2100
gttaccacg	ggctgggcat	cgccgtgata	ccttcgttat	cgaactacac	cacctccatg	2160
ttgcgggtga	acaataacga	tctgccagaa	gggtgcgatg	tcgaaaactc	ggttattcgt	2220
actacgtc	cccagggtgc	catcggtcac	gcaaaactga	atgccaccac	cggataccaa	2280
atcgctcgcg	ttattcgtca	ggaaaatggc	cgcttccctc	cactaggtgt	gaatgtcacg	2340
gataaagcga	caggtaaaga	tgtgggcctg	gtagcggaag	atggcttcgt	ttatctcagc	2400
ggtattcagg	aaaacagtat	tctgcattta	acctgggggtg	ataatactcg	tgaagtcacg	2460
ccgccaacc	aaagtaacat	tagtgaaagc	gcgataattt	tacctgttaa	aacagtcaaa	2520

<210> 95  
 <211> 507  
 <212> DNA  
 <213> Escherichia coli

<400> 95  
 ttgatgaaca caaaacagtc tgttgctcaa ctgcgcgtac cgcaccgcaa gcgcctttca 60  
 tcaacgatgg tgggtggcgt gttactttgt gtggttgctg gcgcggtgat gattaatgcc 120  
 gctgattttc cagcaactgc cattgaaacg gatcccggtg caagtgcctt ccctaccttc 180  
 tatgcctgtg ccctgattgt gctcgtgtgc ttgctggtga tacgcgatct ttgcaggca 240  
 aaaccagcct cttgcgcaa cgcacaggaa aaaccggcat tcaggaaaa agcaacagga 300  
 attcggcga cgcggtttta tattgtggcg atgagctact gcggttatct cattactact 360  
 cctgttttcc tcatcgtcat tatgacgttg atgggctaca ggcgatgggt actcacaccg 420  
 ggtattgcgc tgctgttaac ggcaatcctc tggttgctgt ttgtcgaagc gttacaggtg 480  
 ccattgcctg tcggcacatt tttcgaa 507

<210> 96  
 <211> 933  
 <212> DNA  
 <213> Escherichia coli

<400> 96  
 atggtacttc ttgcaggcgc tgccctcagc attgcgcctg tacaggcagc ctctaccca 60  
 accaaacaga tcgagtttag cgttccttac gctgcggag gcggtagcga tctggttgcc 120  
 cgtgcctttg ctgatgccg caaaaacat ttaccggtca gcatcgggtt tatcaataaa 180  
 cctggcggag gcggtgctat cggcctgagt gaaatcgccg ctgcccgccc taacggttac 240  
 aaaatttggt taggcacggt tgaactgacc acccttccca gcctcggaat ggtgcgtttt 300  
 aaaaccagcg actttaaac cattgcccg ctgaatgcgg atccggctgc tatcacagtc 360  
 cgtgccgatg cgccgtggaa tagctatgaa gaatttatgg ctactccaa agcgaatccc 420  
 ggaaaagtac gcattggtaa ctcaggcacc ggagctatct ggcattcggc ggcagctgca 480  
 ctggaagaca aaacgggcac aaagttttct catgtcccgt atgacggcgc agcccctgcc 540  
 attacaggcc tgttaggcgg gcattattgaa gcggtttccg taagcccagg agaagtatc 600  
 aacctgtgta atggcgga gctgaagaca ctggtagtga tggcggatga gcgaatgaaa 660  
 accatgcctg acgtcccgac gttaaaagag aaaggcgttg atctctccat cggcacctgg 720  
 cgcggcctga ttgtgtcgca aaaaacgccg caggatgtgg tggatgttct ggcaaaggca 780  
 gcaaaagaga cggctgaaga gcctgcattc caggatgcac tgcaaaagt gaatctcaac 840  
 tatgatggc ttgacgtgc cagcttcag ccccaaatca gcgaacagga aaagtacttt 900

gacgagttgc tgactcgctt gggcctgaaa aaa

933

<210> 97

<211> 2166

<212> DNA

<213> Escherichia coli

<400> 97

atgctgcgat gaaacgctg tattattcta acatttatct ctggtgctgc ttctcgcgcg	60
ccagagataa atgttaagca aaacgaatcg ttacctgatt taggtagcca ggcagcacia	120
caggatgaac aaaccaacaa gggtaaatcg ctgaaagagc gcggagccga ttacgtcatc	180
aactccgcca cgcaagggtt tgaaaacttg acccctgagc cgctggaatc tcaggccaga	240
agctatctgc aaagtcaaat cacctcaacc gcacaatctt atattgaaga cacactctct	300
ccctacggta aggtccggtt gaacctctcc attggtcagg gcggcgatct ggatggcagt	360
tccatcgatt tttttgttcc ctggtacgat aatcaaacca ctgtttatct cagccaattt	420
tctcgccaac gaaaagaaga tcgtacgatc gggaattatt gccttggggt aagggtataat	480
tttgataaat atctattggg tggaaatata ttttatgatt atgactttac ccgtggacat	540
cgccgttttag gtttaggcgc cgaagccttg acggattatt taaaattctc agccaactat	600
tatcacccac tttctgactg gaaagactct gaagatttgc acttttatga agaagccct	660
gcgcgcggtt gggatattcg tgccgaagtc tggttacctt cttatccga actggggggc	720
aaaattgtct tcgagcaata ttacggcgat gaagtcgccc tttttgtac ggataatttg	780
gagaaagatc cctacgcggt aacgcttgga ctgaattatc aaccagtgcc gttactgaca	840
gttgggacgc actataaagc ggggaccgga gataacagtg atgtcagcat taatgccact	900
cttaattatc agttcgcggt tccgctaaaa gatcaatttg atagcgataa agtgaagcgc	960
gcgcactcgc tgatgggcag ccgtcttgat ttcgttgagc gtaataactt tattgttctg	1020
gaatacaaaag aaaaagatcc gcttgatgtc accctgtggt tgaagcgga tgccaccaac	1080
gagcacccctg agtcgctcat taaggacact ccggaagcgc ccgtcggtct ggaaaaatgt	1140
aagtggacca ttaacgcact cattaatcat cattacaaaa tcgttcggcg ctctggcgag	1200
gcgaaaaaca atgccgccc cagcctggtg atgccggtta tcaagagaa tactctgaca	1260
gagggtaaca ataaccactg gaacctggtg tgcctgcctt ggcagtacag ttccgatcaa	1320
gccgaacaag aaaaactcaa tacctggcga gtacgtctg cgctggaaga tgaagggc	1380
aaccgacaga actctggcgt ggtggaaatc accgttcagc aggaccgtaa aatagagttg	1440

attgttaata acatcgcgaa cccagaagag aacaaccaca gccacgaagc cagcgcacag	1500
gcagatggcg ttgatgggtg agtgatggat ctcatgttaa ccgacagctt tggcgataac	1560
accgaccgca acggcgatgc gttgccggaa gataacctta cgcctcagct ttacgacgcg	1620
caggacaaac gagtgacgtt aaccaacaag ccctgctcga ccgataaccc ctgcgttttt	1680
attgccaaac aagataaaga aaagggcact gtcacctctt ccagtacctt acctggcacc	1740
tatcgctgga aagcaaaagc cgcgccctac gatgacagta actatgtgga tgtcactttc	1800
ctcggggcag aaattgggtg gctaaatgct tttatctatc gtgtgggggc ggctaaaccc	1860
agcaacctga taggtaaaga taaagaaccg ttgccgtcaa caacatttat cgatttgttt	1920
tatggcgcca caacaataaa gacggtgtct tccagcaggt cgaataacct gacgaagaga	1980
tgggtcagta cgactacaag tgggaattta ccggcaagag catcaatggt aagtgggtgc	2040
acaggcgcaac actccaatga ggacattgtg attccggcca ctaaccgtga agcggcgcaa	2100
acctatggcg cacaagcggg agatggcttg cagggatacg gtttacgcgt gctgtatacc	2160
aaaaaa	2166

<210> 98  
 <211> 957  
 <212> DNA  
 <213> Escherichia coli

<400> 98	
atgaagcagg ataaaagacg cggctcgacc cggatcgcat tagcgtggc actggcaggt	60
tattgtgtgg cacctgtgac gctggctgaa gacagcgctt gggctgacag cggtgaaacc	120
aatatatttc aggggaccat tccgtggctc tattcggaag ggggaagtgc tacgacagat	180
gccgaccgtg taacgttgac ttctgatcta aaaggcgctc gcccgcaagg catgaaacgg	240
acaagcgttt ttactcgggt gataaatatt ggtgataccg aaggcgacgt ggaatttggt	300
ggattgggag ataacgcgaa aactatcgat actatccgct ggatgagcta caaggatgcg	360
cagggggggg atccaaaaga gctggcaacg aaggtagaca gttacactct taccgatgcc	420
gaccgtggtc gctatatcgg tattgaaatt acgccaacca cgacacggc tacgccaac	480
gtcgggactg cgctgcactt ttatgacgtt tctactgcca cggcgcgagg aagcgacagc	540
gataacgttg caccggggcc ggtggttaac cagaacctga aagtcgcat ctttgttgat	600
ggtaccagta tcaaccttat caacggtagc acaccaatcg aacttggcaa aacctacgtg	660



gccaaactgt actcggatga gaacaaaaat ggcaagtttg atgcgggtac cgatgctgac	720
gtcaccgcca attatgactt ccgttgggta ctttctggga gcagccaaca gcttggcact	780
tcgggtggca tcgttaactc aagcttcgat aataacaatt tggatcatcc tcgcaccaac	840
gacgaagcca gaaccaacct taacggccct gcgcgcgatg gaaaagaggc actttccatc	900
ccgaccaacg gcgacggggt acagggttac aaacttcaca ttattttacaa acacaaa	957

<210> 99  
 <211> 1887  
 <212> DNA  
 <213> *Escherichia coli*

<400> 99	
atgaagaaag tgctcactct ctactactgt gctctgtgtg tgtctcatag tgcagtagca	60
gcaaaactata cgttcaataa cgataatatt gccctctcgt ttgatgatac aaactcgacg	120
atttgtctga aggaccgtag aactaaccat ccgatacacac cacaggaatt gttctttctg	180
acactaccgg atgagacaaa aatccacacc gcagatttca aaatcaagca catcaaaaaa	240
caggacaatg cgattgtcat cgacttttac cgcccgatt ttaacgtaac agtgcagttg	300
aaccttgtga agggaaaata tgccagcatc gactacacta ttgccgccgt tgggcaacca	360
cgagacgtcg ccaagattac cttcttcccg accaaaaaac agtttcaggc tccttacgta	420
gacggcgcaa tcactagctc accgatoatt gcggactcgt tctttatcct gccgaataaa	480
ccgatcgtga atacctacgc ctatgaagca acaaccaatc tcaacgtaga actgaaaact	540
ccaattcagc cagagacgcc ggttagcttt accacctggt tcggtacttt ccggaaacc	600
agccagttgc gacgcagttg gaaccagttt attaatgccg tacgtccacg tccgtacaag	660
ccttatttgc attacaacag ttggatggat atcggctttt tcactccgta caccgaacag	720
gatgttctgg gacgcagtga cgaatggaac aaggaattca ttagcggcgg cgagtgggcg	780
ttagacgctt ttctgctgga cgatggctgg gacgatctta ccggacgctg gttatttggc	840
ccggcatcca gcaacggttt tagcaaagta cgagagaaaag ccgatagcct gcacagctcc	900
gttgggctat ggccttcacc gtgggggggt tacaataaag cgacagcagc ttcgcgtttc	960
gcattgcaaaa gagtatgggt tcgaaaccgt ggacggcaag ctggcgcttt cgggagcgaa	1020
ctacttaaaa acttcaatga gcagatcatt aatcttatca aaaatgaaca cattacctcg	1080
tttaaaactcg acggaatggg gaacgccagt tcacatataa agggtagccc gttcgccctg	1140
gattttgatg cgtcaatagc tctgctgcac aatatgcgca gagcaaaccc gaatctattt	1200

atcaacctga ccaccggcac caacgccagc ccgtctcgtt tgttctatgc tgattctatc	1260
tggcgtcagg gggatgatat aaacctgtat ggccccggca cgccgggtga gcagtggata	1320
acatatcgtg atgccgagac ataccgctct attgtacgta aagcccgctt attcccgtg	1380
aactcgtgta tgtaccacgg gatagtcagc gccgagaatg cctattacgg gttagagaag	1440
gtgcaaacgg acagcgactt tgccgatcag gtctggagct acttcgcgac cggcaccacg	1500
ctgcaggagc tgtatatatt cccgtccatg ctgaacaagg tgaagtggga tacgctggcg	1560
aaggctgcaa aatggtcgaa ggaaaaatgcc agcgtgcttg ttgataccca ctggattggc	1620
ggcgacccaa cggcgcttgc cgtgtacggc tgggcacccg ggagcaaga caaagccatt	1680
ctcggtttgc gcaaccatc ggataagcca cagacctaact atctggattt ggcgaaggat	1740
ttcgaaatac cggcaggaaa gcgcggcgag tttagtctga aagcggtata cggcagcaat	1800
aaaacagtgc ccgttgagta taaaaacgcg acggtgatta cgttgcagcc gctggaaaacg	1860
ctggtgtttg aggcggtgac cattaac	1887

<210> 100  
 <211> 5334  
 <212> DNA  
 <213> *Escherichia coli*

<400> 100	
atgaacaaaa tatttaaagt tatctggaat ccggcaacag gcagttacac cgttgccagc	60
gaaacggcga agagccgtgg taaaaaaagc gggcgagta agctgttaat ttctgcactg	120
gttgcgggtg ggttgttgtc gtcgtttggg gcaagtgcag ataattacac tgggcagcca	180
actgattatg gcgatggctc agcaggtgac ggctgggttg ctatcggtaa aggggcaaaa	240
gcaaatacct ttatgaacac tagtggcgcg agtacagctt taggatatga cgcgatagcc	300
gaagggtgagt acagttctgc catcggttca aaaacccttg caactgggtg agcatccatg	360
gcgttcgggg ttagtgcaaa agcaatgggt gacagaagtg tcgcgctagg tgcacgttca	420
gtagcaaatg gcgatcgttc gatggctttt ggtcgtttacg caaagacgaa tggttttaca	480
tctcttgcta ttggggactc ctcccttgcc gatggtgaaa aaactattgc gtttagaaat	540
acggcctaag cttacgaaat tatgagcacc gccctcggtg ataatgccaa tgcgtcaaaa	600
gagtatgcaa tggcgctggg agcaagtagc aaagctggcg gtgctgatag cctcgcattc	660
ggcagaaaat ctacagctaa tagcactggc tcactggcaa taggtgctga cagtagcagt	720

tcgaacgata acgccatcgc gatagggaac aaaacgcaag ccctgggagt gaattcgatg	780
gccctgggta atgcaagtca ggcatctggc gaatccagta ttgcattagg taaccaccagt	840
gaagccagcg aacaaaatgc gattgcgctg gggcaaggta gcattgcaag caaagtgaac	900
tcaatcgcgt tgggaagtaa cagtttgctc tcgggagaga atgccatcgc attggggagag	960
ggtagtccg ctggtggcag caacagcctt gctttcggta gccagtcagg ggcaaacggc	1020
aatgattctg tcgccatcgg tgtaggggct gcagcagcga ccgacaattc tgtcgctatc	1080
ggcgaggat cgaccacaga tgcaagcaat acggtttcag ttggcaacag cgcaacaaaa	1140
cgaaaattg ttaatatggc tgctggtgcc ataagcaaca ccagtaccga tgccatcaac	1200
ggctcacagc ttatatacat cagtgtattc gtcgccaaagc gactcgagg aggcgctact	1260
gtaggcagcg atggcacctg aaccgcagta agctacgcgt tgagaacggc aacctataat	1320
aacgtgggtg atgctctgtc aggaatcgac aataataacc tacaatggaa taaaaccgcg	1380
ggggcggtta cgcgcaatca cggcgcaaat gccaccaaca aaatcactaa tgttgctaaa	1440
ggtacggttt ctgcaaccag caccgatgta gtaaacggct ctcaattgta cgactgcag	1500
caggatgctc tgttgtggaa cggcacagca ttcagtgcg caccggcac cgaagccacc	1560
agcaaatca ctaacgtcac cgctggcaac ctgactgccg gcagcactga cgcggttaac	1620
ggctctcagc tcaaaaaccac caacgacaac gtgacgacca acaccaccaa catcgccact	1680
aacaccacca atatcaccaa cctgactgac gctgttaacg gtctcgggta cgactccctg	1740
ctgtggaaca aagcagctgg cgcattcagc gccgcgcagc gcaccgaagc caccagcaaa	1800
atcaccaacg tcaccgtcgg caacctgact gccggtagca ctgacgccgt taacggctcc	1860
cagctcaaaa ccaccaacga caacgtgacg accaacacca ccaacatcgc cactaacacc	1920
accaatatca ccaacctgac tgacgtgtt aacggctctg gtgacgactc cctgtgtgtg	1980
aacaaaacag ctggcgcatc cagcgccgag caggcactg acgccaccag caagatcacc	2040
aacgtcaccg ctggcaacct gactgcccgc agcactgacg ccgttaacgg ctcccagctc	2100
aaaaccacca acgacaacgt gacgaccaac accaccaaca tcgccactaa caccaccaat	2160
atcaccaacc tgactgacgc tgttaacggc ctgggtgacg actccctgct gtggaacaaa	2220
acagctggcg cattcagcgc cgcgcacggc actgacgcca ccagcaagat caccaatgtc	2280
aaagccggtg acctgacagc tggcagcact gacgcccgtt acggctctca gctcaaaacc	2340
accaacgata acgtgtcgac caacaccacc aacatcacca acctgactga cgctgttaac	2400

ggtctcgggtg	acgactccct	gctgtggaac	aaaacagctg	gcgattcag	cgcgctcac	2460
ggcactgacg	ccaccagcaa	gatcaccaat	gtcaaagccg	gtgacctgac	agctggcagc	2520
actgacgccg	ttaacggcto	ccagctcaaa	accaccaacg	ataacgtgtc	gaccaacacc	2580
accaacatca	ctaacctgac	ggattccgtt	ggcgacctta	aggacgattc	tctgtgtggg	2640
aacaaagcgg	ctggcgctt	cagcgccg	cacggtaacc	aagctaccag	caagatcacc	2700
aacttactgg	ctggcaagat	atcttctaac	agcactgatg	ccattaatgg	ctcacaactt	2760
tatggcgtag	cggattcatt	tacgtcatat	cttgggtggg	gtgctgatat	cagcgatacg	2820
ggtgtattaa	tggggccaac	ctacactatt	ggtggtactg	actacactaa	cgtcgggtgat	2880
gctctggcag	ccattaacac	atcatttagc	acatcactcg	gcgacgccct	actttgggat	2940
gcaaccgcag	gcaaattcag	cgccaaacac	ggcattaata	atgctcccg	tgtaatcact	3000
gatgttgcaa	acggtgcagt	ctcgtccacc	agcagcgacg	ccattaacgg	ttcacaactt	3060
tatgggttta	gtgactacat	tgcgatgct	ctgggcggga	atgctgtggt	gaacactgac	3120
ggcagtatca	ctacaccaac	ttagtccatc	gctggcggca	gttacaacaa	cgtcgggtgac	3180
gcgctggaag	cgatcgatac	cacgtgggat	gatgctctgc	tgtgggtatc	aacagccaat	3240
ggcggtaacg	gtgcatttag	cgccgctcac	gggaaagata	aaactgccag	tgtaatcact	3300
aacgtcgcta	acggtgcagt	ctctgccacc	agcaacgatg	ccattaatgg	ctcacagctc	3360
tatagcacta	ataagtacat	cgctgatg	ctgggtgggt	atgcagaagt	caacgtgac	3420
ggtactatca	ctgcaccgac	ttacaccatt	gcaaataccg	attacaacaa	cgtcggtgaa	3480
gccctggatg	cgctcgataa	taacgcgctg	ctgtgggatg	aagacgcagg	tgccataaac	3540
gccagccatg	atggcaatgc	cagcaaaatc	accaacgttg	cggtgtgta	tctctccaca	3600
accagtaccg	atgctgttaa	cggttcccag	ttaaacgcaa	ccaatatctt	ggttacgcaa	3660
aatagccaaa	tgattaacca	gcttctggt	aacactagcg	aaacctacat	cgaggaaaac	3720
ggtgcgggta	ttactatgt	acgtaccaac	gacagcggct	tagcgttcaa	cgatgccagc	3780
gcttcaggta	ttggcgctac	agctgtaggt	tataacgcag	ttgcctctca	tgccagcagt	3840
gtagccatcg	gtcaggacag	catcagcgaa	gttgatacgg	gtatcgctct	gggtagcagt	3900
tccgtttcca	gccgtgtaat	agttaaagg	actcgtaaca	ccagcgtatc	ggaagaagg	3960
gttgtgattg	gttatgacac	cacggatggc	gaactgcttg	gcgcgttgtc	gattggtgat	4020
gacggtaaat	atcgtcaaat	catcaacgtc	gcggatggtt	ctgaagccca	tgatcggttc	4080
actgttcgcc	agttgcaaaa	cgccattggt	gcagtcgcaa	ccacaccaac	caaatactat	4140

cacgccaact caacggctga agactcactg gcagtcggtg aagactcgct ggcaatgggc	4200
gcgaaaacca tcgttaatgg taatgcgggt attggtatcg gcctgaacac gctggttctg	4260
gctgatgcga tcaacgggat tgctatcggt tctaacgcac gcgcaaatca tgccgacagc	4320
attgcaatgg gtaattggtc tcagactacc cgtggtgcgc agaccaacta cactgcctac	4380
aacatggatg caccgcgaaa ctctgtgggt gagttctctg tcggcagtga agacgggtcaa	4440
cgtcagatca ccaacgtcgc agcaggttcg gcggataccg atcggtttaa cgtgggtcag	4500
ttgaaagtaa cggacgcgca ggtttcccag aatacccgca gcattactaa cctgaacact	4560
caggtcacta atctggatac tcgcgtgacc aatatcgaaa acggcattgg cgatactgta	4620
accaccggta gactaaagta cttcaagacc aacaccgatg gcgcagatgc caacgcgcag	4680
ggtaaaagca gtgttcgat tggttctggt tccattgctg ccgctgacaa cagcgtcgca	4740
ctgggacggt gttccgtagc agacgaagaa aacaccatct ctgtgggttc ttctaccaac	4800
cagcgtcgta tcaccaacgt tgctgccggt gttaatgccg ccgatgcggt taacgtttcg	4860
caactgaagt cttctgaagc aggcggcggt cgctacgaca ccaaaagctga tggctctatc	4920
gactacagca acatcactct cgggtggcgc aatagcggtg cgactcgcat cagcaacgtt	4980
tctgctggcg tgaacaacaa cgacgcagtg aactatgcgc agttgaagca aagtgtgcag	5040
gaaacgaagc aatacaccca tcagcgcgat gttgagatgg ataacaact gtccaaaact	5100
gaaagcaagc tgagtgtgtg tatcgcttct gcaatggcaa tgaccggctt gccgcaggct	5160
tacacgccgg gtgccagcat ggcctctatt ggtggcggtg cttacaacgg tgaatcggt	5220
gttgctttag gtgtgtcgat ggtgagcgcc aatggctggt ggggtctacaa attacaaggt	5280
agtagcaata gccagggtga atactcggc gcactcgggt ccggtattca gtgg	5334

<210> 101  
 <211> 681  
 <212> DNA  
 <213> Escherichia coli

<400> 101	
atgaacctaa agaaaaacact gttgaagcgtg ttaatgatat tgcaactttg cttattggta	60
gggtgtgact atattgaaaa agcgagtaag gtcgacgatc tcgttacaca gcaagagttg	120
caaaaaagca aaattgaggc gcttgaaaaa caacaagaac tcgacaacgg caagatagaa	180
cactttgaaa aacaacaacac taccatcata aacagtacca aaacgctcgc tgggtgtggtg	240

aaggcagtta	aaaacaaca	ggacgaattt	gtctttacag	aatttaaccc	ggcacaaccc	300
caatacttta	ttttaataa	cggctctgtt	ggtttggcag	ggaaaaact	gtctattgac	360
gcagtagaaa	acggcagtg	tattcgtatt	tacttggtta	acttattaag	tgctcctgta	420
tcaaatatgg	gtttctacg	aacatggggg	ggagaaaaac	ccaccgacat	caacgcatta	480
gcaaaatggc	agcaattgct	atttagtacc	gcaatgaact	cctccctgaa	attattacca	540
ggtcaatggc	aagacattaa	tttgacgcta	aaaggtgtct	cgccaacaa	cctcaaatat	600
ctgaaattag	ccatcaacat	ggcaaatatt	cagttcgacc	gtcttcaacc	tgctgaatct	660
ccacagcgga	aaaacaaaa	a				681

<210> 102  
 <211> 3327  
 <212> DNA  
 <213> Escherichia coli

<400>	102		
atgaaaagag	ttgtgcgtct	tttgggtgtg gggttactgc tccttgttgt gttgttgc	60
attttgtttg	ttctggctca	gaccacaccg ctgatatacag cacaggatga gcatgctgtc	120
tggtctcgtc	tggtgataac	agcgattgtg atctgtttgc taagtatgtg catatttttc	180
ctcttttctt	tccggcgaga	cgaagcctcg acgatatacag tatacgctca accgactgat	240
ataaaggaaa	taaatacgga	gcagccgaac tatgcatcac tgetgacgat atatttacgc	300
gaccgctacg	gtccgtttctg	gcggcgtaaa gtccgcctgc tgetggtgac cggcgagcct	360
gaacaggcag	aagccatcgc	gccggggctg accgggcaac actggctgga aggcgaccac	420
acggtgctga	tatatggcgg	caggccaaca gcggagcctg atgtcacact gctgaccgcc	480
ttaaaaaac	tgcgcccgag	ccgtccgctg gacggcatca tctgggcgct gacagaagaa	540
cagagccgcc	agacagcgca	actcgacaaa ggctggcgcg gactgataaa cggcggttaag	600
cgactcggtt	ttcaggctcc	actctatttg tggcagggtct gtgacgacgg tgattatcag	660
accggagccc	ccctgcaaa	cgctggctgc ctgctgccgg aacgctgtac cccgaacaa	720
ctggctgtaa	tgctggaagc	agccgctgac ggaacagggc atgtcgcagc tactgaccga	780
taccgcatgt	ttttctgtgc	gtctggctca tacccttgca gagcgggta ttgctcactg	840
gcagaccgtc	ctgaaaccgc	tgctggcagg cggcgcatct tcttccctgc gcctgcgcgg	900
cctgatgttc	agcccccgcc	ttgcgcccgt gccggaggcc agcacctcat gcagtggctg	960
ccgtcaccgg	tctgggcggg	cgtgacggtg ataacgcgcg cgggcgcacg gtgggttttc	1020

ctgtggctgc	gtaccgcact	gatgtccgct	gtctgcgtgc	tggtgatatg	gggggccgga	1080
atgacgacct	cggtctctgc	caaccgcgct	ctgttccagg	aaaccgggat	ccagacggca	1140
cgtgcgcttg	atacccgctt	gccgctggca	gaacaactgg	tgccgctgca	taccctgcag	1200
ggcgaaactg	aacgcctgca	atctcgtatc	cgcgaagggt	cgccgttgta	tcagcgtttt	1260
ggccttgaac	gtaaccaaca	actgctcgcc	gccgcttttc	ccggtctatg	gcaggcgcca	1320
aaaccggctg	tgccgcgact	ggccgttgac	catctgcaac	agcaactgaa	cgcccttggc	1380
gccctgccgc	ccaacagtcc	tcagcgtacc	gccaccgggt	aacaacgcta	taagcagctt	1440
aaggcattgc	tgatgaactc	ccgcccggaa	aaggccgacg	ctgccttttt	cagtaccacg	1500
ctgatggcgg	acggtctgcg	ctacgagaat	atcccgggaag	gtgtgcggca	gagcgtgttg	1560
ccgtcactgc	tgaccttctg	gacggcgaac	ctgccggaac	accgcgagtg	gaaaacatcg	1620
ccgccaccgg	aactgaccgg	cgcagtgctg	aaaatcctgc	tgccgccagat	tggtgtgcgt	1680
aatgccgaaa	acacctctca	ccagaacgtg	ctgcaacagg	tgtcccgcaa	ctacgccgat	1740
atgacgctgg	cggacatgac	cggggatacc	ctcaccgaat	ctctttttcag	tcaggaaacag	1800
acggtgccgg	ggatgttcaac	ccgtcaggcg	tgggaaggac	aggtcaggga	agccatcgag	1860
cagggtgtga	cgccgcggcg	cgaggaaatc	gactgggtac	tcagcgaccg	ccagcaggat	1920
acctctcgcg	atatctcgcc	ggatacgtcg	cgtaaccgtc	tcacctcacg	ctactttacc	1980
gactttgccg	gaagctggct	ggcgtttttc	aacagcattc	actggaaaaa	ggaagactcg	2040
ctctccggga	ttctcgacca	gctgacactg	atggccgatg	cccgctcagtc	gccactgatt	2100
gcgctgacgg	acacctctgc	gtggcaggcg	gcgacaggca	gggaaaaccg	tggtctgtca	2160
gactcgctgg	cgaaatcgcc	acaggaaactg	tttaacggca	aggagaaaac	gccgcagcaa	2220
tcccgtaag	gtgacgacgt	gcctgtcggg	ccgctggata	aaaccttcac	gccgctgtcg	2280
cgtttctgtg	gcgataaggc	cggaggcgcg	gacagccagc	tgagtctaca	gacctacctc	2340
accgcgctca	cccgcgtgcg	cctcaaaactg	caacagggtg	ccaacgcccc	cgaccgcgag	2400
gagatgacct	aacaactggc	gcagacggtc	ttacagggtg	aaaccgttga	cctcaccggac	2460
accgcgact	acggacgggt	aatcgccgcc	agtctggggc	aagaatggag	tggtctcggt	2520
caggcgctgt	tcgttcgcc	ggtagagcag	tcgtggcggc	aggtgctgac	gcctgcggcg	2580
gacagcctga	accgccagtg	gcagcggggc	attgtcagcc	actggaatca	ggacttcgct	2640
ggccgctatc	cggttcaaagc	ctcacagaac	gatgcctccc	tccccctgct	ggcgcagtac	2700

ctgcgcgatg acggggcgcac caacctgttt atcgccgccac acctttccgg cgtgctgaaa	2760
cgagaggggcc gctactgggt ggctgacgcc atgaacacgc aggggctgac ggtcaatccg	2820
gactttatcc gcgcctgaa ccgcctgcgc gacgtggccg ataccgcctt tgccagcgcc	2880
gatgccggga tacattttga actgcgggca aaaccggcgc gtgacgtgat gaagacgcac	2940
ctggtgatg acgggcagga gctggaatat ttcaaccaga aagaacgctg gcagcgtttt	3000
aactggccgg atgaacagt gcaaccggcc gcacgcctaa gctggaccag cacacaggcg	3060
atggagcgca tactggcgga ttaccgggga agctggagtc ttattgcct gctggaacag	3120
gcgcaggtga cgccggtgga cagcagcacc tttaaagtggt tgtggaaagc gcaggacggc	3180
ctgccgtga attacctgct acgggttgaa cagggtaaa ggccgctggc gctgctggag	3240
ctgaaaaact tccgcctgcc gggacaggtg tttctgaccg gaaaaagtat gaaggatgtg	3300
gaagagtatg gggaagacgc cgatgag	3327

<210> 103  
 <211> 534  
 <212> DNA  
 <213> Escherichia coli

<400> 103	
atgtttccta ttctgtttta acgtccggcg ttgctctgta tggcgatgct gacggttgtt	60
ctgagtggtc gcggcctgat tcagaaagtg gtggatgaat cgaaaagcgt ggccctagcc	120
gttttctaca aacaaatcaa aatactgcat ctcgatttct tctcccgag cgccctgaat	180
acggatgcgg aagatacgcc gctttccacg atggtgcatg tctggcaact gaaaaccgcg	240
gaagattttg acaaggcgga ttacgacacc ctgtttatgc aggaagagaa gacgtggag	300
aaggacgtac tggcaaaaca caccgtctggt gtaaaaccgg aaggcagcgc atccctgaat	360
gtgccgctgg ataaagagac gcagtttgtc gccattattg ggcagtttta tcaccctgat	420
gaaaaaagcg acagctggcg tctggtgatc aaaaggagc aactggaggc cgacaagccg	480
cgctcgattg aactgatgag aagcgacctg cgactgctgc ctctcaagga taaa	534

<210> 104  
 <211> 840  
 <212> DNA  
 <213> Escherichia coli

<400> 104	
atgatctcag ggggaaatat gttgaagaa tggatgatat ttacgtgcag tttattgact	60



ctggctggg	cgctactgcc	cctcagtggc	tgtatttcca	gaggccagga	gtctatatcc	120
gaagggcg	catttgggc	agggatcctg	cgcaaccgg	gagcaacaaa	aaaagccgac	180
acgaaagacc	tcaatgtgcc	accaccggtt	tatggtcgcg	cgcagtgat	atttcgcatt	240
gatgacaacc	gctatttcac	gctagaaaat	tataccacct	gcgagacgg	gcagacgttt	300
tataataata	aagcaaaaa	cattcatgtt	aaaatattag	acgcttcagg	gtatttattt	360
aaagggcgct	tattctgttt	atcaacgcgt	gatgattttc	tggcctttcc	tgccacgtta	420
aataccagac	acgcttcctg	tatggggctg	aataaaggct	gtatgaatgc	ggtcattgtc	480
actaccgatg	gtggaaaaag	acgcagtggt	gtgccatacg	gcagttatac	ccagaatccg	540
accggtgcca	cgagggatta	tgacatgctg	gtgatgaatg	acggcttcta	cctgcttaga	600
tatcgggggg	gacagggcag	atttagtccg	gtgatactta	gatggattct	cagtactgaa	660
gatagctctg	gtgtgtgtgc	ttcagaagat	gcttatgaat	tgttccgctc	cggagaagag	720
gtaccctcca	ccggttttta	taaaatcgac	ctgtcacgtt	tttatcccaa	aaacaacgtt	780
atggaatgc	agtgtgacag	gacgctggag	ccagttcaac	cttcagagag	taaaattcaa	840

<210> 105  
 <211> 1503  
 <212> DNA  
 <213> Escherichia coli

<400> 105	
atggaacacg	ttagcattaa
aacattatat	catctcctgt
gctgtatgct	gctctttatt
60	
tccgctatgt	gcgctttggc
gcaagaacat	gagcctatcg
ggcgcaaga	tgagcgctg
120	
tgcacattaa	ttcaccaacg
gatgcaggag	gccaaaggcc
cagcccttcc	cgtaagtggtg
180	
accattaagg	gggtacgtca
gcgatttgtc	tacgggtgtg
ccgatgtggc	tagtcagaaa
240	
gcgaatactc	tagacacagt
ttacgagctg	ggatcgatga
gtaaggcggt	taccggacctt
300	
gtggtgcaaa	tactgattca
ggaaggcaga	ctcggcgaag
gggatgatata	cattacctat
360	
ctgccggaaa	tgcgcttgaa
ttatcaggga	aaacctgctt
cctgaccgtg	ggctgatttc
420	
ctttatcata	catcaggatt
gcctttttca	acactggctc
ggctggaaaa	ccctatgcct
480	
gggagcgctg	tggcacagca
actgcgcaac	gagaatctgc
tgtttgcgcc	gggtgcgaag
540	
tttagctatg	cctccgcca
ttatgatgtg	ttggcgcg
tgattgaaa	tgtagcgga
600	
aaaaccttta	cagaggtcat
tgcggaacga	ctcacgcagc
cgctggcat	gtcgcgact
660	

gtggcagtta aggggggatga gattattgtc aacaaggcaa gcggtataa actgggattc	720
ggcaaacccg ttctgtttca tgcgcctctg gcccggaacc atgttcctcg cgcctatatac	780
catagcactc tgcctgatat ggaaatatgg atagacgcct ggttgacacg aaaggctttg	840
ccggcaacgc tgcgtgaggc gatgagtaac agttggcgtg gtaatatgta tgttccgctt	900
gccgcagaca atcgtatcct ctatgccagc ggttggttta tcgaccagaa tcaaggccct	960
tacatcagtc acggtgggca gaatccaaac ttttcttctt gcattgcgtt gcgaccggat	1020
cagcagattg gcattgttgc gctggcaaat atgaattcga atctgatact acagctttgc	1080
gcggtatatc ataattatct gcgcattggc aaatatgctg acggcgctgg tgatgcaatt	1140
acagccaccg ataccctttt cgtctacctc acgttgttgc tgtgtttttg gggggcggtg	1200
gttgtagtgc gcggtgcttt ccgtgtttat cgcgcaacgg cgcgtggccc tggaaaaacg	1260
cagaggttac gtttacgcgt acgtgactat atcatcgctt tggcggttcc tgggctcgtg	1320
gccgccatgc tctatgtcgc accgggtata ctatctccag gacttgactg gcgtttttatc	1380
ttggtatggg gtccatcgag cgtgttggcg ataccgcttg gaattatcct gttagctttc	1440
gttctgacat taaatcatca aattaaacga attctattac acaacaagga gtgggacgat	1500
gag	1503

<210> 106  
 <211> 2046  
 <212> DNA  
 <213> *Escherichia coli*

<400> 106	
atgaagaaca aatatatcat tgctccgggc attgccgtga tgtgttctgc agttatatca	60
tcaggttatg ccagtcttga taaaaaagaa gatacgcttg ttgttactgc ctccgggttc	120
actcagcagc tcagaaatgc cccggccagt gtctcagtca ttacttcaga acaactgcaa	180
aaaaaacccg tttcagatct ggtcgatgca gtaaaagatg ttgaagggat tagtatcact	240
ggtggggaatg aaaaaccgga tatcagtata cgtggtctaa gtggcgatta cacgctgatt	300
ctggctcagtg gacgacgtca gagcggtcgg gaatccagac caaacggcag cggcggtttt	360
gaagccggat ttatccctcc tgtggaagca attgaacgca ttgaagtgat ccgtggccct	420
atgtcttccc tgtatggttc tgatgccatc ggaggggtca ttaatatcat aaccaaacca	480
gttaataacc aaacatggga tggcgtactt ggacttgggg ggattattca ggaacatggg	540
aaatttgga actcaaccac aatgacttc tatctgtcag gccattgat taaggataaa	600

cttggctctc agctatatgg aggaatgaac tatcgcaagg aagatagtat ctctcaggga	660
acaccggcaa aagataataa gaatataacg gcaacgctcc agtttactcc gactgaaagc	720
cagaagtttg tttttgaata tggaaaaaat aaccagggtg atacattaac acctgggtgag	780
tctctcgatg cctggactat gcggggaaat cttaaacaac caaacagtaa aagagaaaacg	840
cataattcac gtagtactg ggtagcagca tggaatgccc agggcgaaat actgcatcct	900
gaaattgctg tttatcagga gaaagtatt cgtgagggtta aatcaggtaa aaaagataaa	960
tataatcatt gggatcttaa ttacgagtca agaaaaccgg aaataaccaa cacaatcata	1020
gatgcaaaag tgacggcatt tctgccgga aatgtactga ccacggagg tcaatttcag	1080
catgcagagc tccgtgatga ctccagccacg ggtaaaaaaa cgacagaaac acagtctgtt	1140
tcaattaac agaaagctgt ttttatagaa aatgaatatg cagcaacgga ttctctcgcc	1200
ctgactggag gactgcgtct cgataatcat gaaatctatg gcagttactg gaatccaaga	1260
ttgtacgtg tttataacct gaccgataat ctccactca aaggggggat cgcaaaagca	1320
tttcgggctc cttcaattcg tgaggtagt cctggatttg gaacactgac gcagggtggt	1380
gcctctatta tgtatggaaa caggggacctg aaaccggaga ccagtgtaac cgaagagatc	1440
gggtattatt atagtaatga tagtggtttt tcggcgagcg cgacgctgtt taatactgat	1500
tttaaaaaa agttgaccag ttacgatata ggtacaaaag atccagtcac cgggttaaac	1560
acttttatt atgataatgt aggtgaggca aatatcagag ggggtggagc tgcaactcag	1620
attcctgtgt atgataaatg gcatgtatct gcaactata catttactga ctctcgtcga	1680
aaaagtgatg acgaaagtct caatggcaag tcgctgaaa gggaaacctt ggaagaact	1740
cccagacatg cagccaatgc aaaactggaa tgggattaca ctccagatat tacattttat	1800
tcactcttga attatccggg aaaacaaatc tgggcagcac aaagaaatg tgctaagggt	1860
ccccgcgttc gtaattgatt cacatctatg gatattggtc taaattacca gattctgcc	1920
gacacgtgta ttaattttgc cgtttctaac gtcacagaca gaaagagcga ggatcatgat	1980
accattgatg gtaactggca ggtcgatgaa ggacgccgtt attgggctaa tgtaagagta	2040
tccttc	2046

<210> 107  
 <211> 492  
 <212> DNA  
 <213> Escherichia coli

<400> 107

atgggggttta gaaaaacaat aatcacttcg gtaggtttga tttttatttc attctctttt	60
gtggcaaaagt gctctcaact caaaaatttg aataattact cagtgtatgt ttgtggaaaa	120
gtgtcaaata atactctgga tgatattggt gggtataaag aaagaaatat attaatgtgt	180
cgagctataa aaaaaatcat aataatgaca atcgtaaata ttatatTTTT ctattccttt	240
caatcgactg cggaatgaaat ggttttaata aaaaaatcgc ggtttgggct tgagagagat	300
atcaaaggaa ggccattaat ttatcctatc gaaaattatg atgagtgtaa gaaaaaatgc	360
aatcatatga attatatagc ggatgtcaat gctcaattag ctatgagtaa aaaaaataac	420
aggatTTTTg ctaacataac ctttactaac aatagctcta ccagctattt ttttctaatt	480
attatctacc ta	492

<210> 108

<211> 654

<212> DNA

<213> Escherichia coli

<400> 108

atgaatcaaa ttaaagataa taaggtaatt atgaaaaata aaaaattaat atcagtcatt	60
ttactatcag gaggtattat ggggactgga ttgtactcga gcgataacca tcaaaaaaac	120
cgagcaggt ttaatatata ggaatcatat tgtgccatta agactaatgg tgccttggga	180
ttcagcaacc gaaaggatgt attgcgagaa aatgggtgatt caaccggaac caccagttcc	240
agcactaatg ccatgatgct gatggaaaat ggtgaaaatg aaatcagtcct ggagattggg	300
gcgttaaagg ggttttctga taaacctgcc agtaccgaag aacgagggca tttctcccaa	360
aaagcagggg gcagctctgga tttggttcgt tttgttaagc aggaagaaac catactttct	420
tcgataaagg tgaccatcaa ccagcaggga atacctgaag cgcagccaga cagcatgcat	480
cctgttatcc gaaaagagat tctggctgag caggcagaac ccgatttat tgatccagac	540
tatttttaag aaacttattt cccgaaaggg atgaagggtg atcaatttac acaaaaggtc	600
tcggtggcgg ggcttctcta tgggcctgga cgcagtagcg cctttaccgg agca	654

<210> 109

<211> 8198

<212> DNA

<213> Escherichia coli

<400> 109

atgcatcagc	ctcccgttcg	cttcacttac	cgccctgctga	gttacctgggt	cagtgcgatt	60
atcgccgggc	agccgttggt	accggctgtg	ggggccgtca	tcaccaccaca	aaacggggcc	120
ggaatggata	aagcggcaaa	tgggtgtgccg	gtcgtgaaca	ttgccacgcc	gaacggggcc	180
gggatttcgc	ataaccggtt	tacggattac	aacgtcggga	aggaagggct	gattctcaat	240
aatgccaccg	gtaagcttaa	tccgacgcag	cttggtggac	tgatacagaa	taaccogaac	300
ctgaaagcgg	gcggggaagc	gaaggggtatc	atcaacgaag	tgaccggcgg	taagcgttca	360
ctgctgcagg	gctatacgga	agtggccggc	aaagcggcga	atgtgatggt	tgccaaccgg	420
tatggtatca	cctgtgacgg	ctgtggcttt	atcaacacgc	cgacgcgac	gctcaccacg	480
ggcaaacctg	tgatgaatgc	cgacggcagc	ctgcaggcgc	tggagggtgac	tgaaggcagt	540
atcaccatca	atggcgcggg	cctggacggc	accggagcgc	atgccgtatc	cattattgcc	600
cgtgcaacgg	aagtgaatgc	cgcgcttcat	gcgaaggatt	taactgtcac	tgcaggcgct	660
aacctgttaa	ctgcagatgg	tcgtgtcaga	gccctgaagg	gcgaagggtga	tgtgccgaaa	720
gttgccgttg	ataccggcgc	tctcggtgga	atgtacgcca	ggcgtattca	tctgacctcc	780
actgaaagtg	gtgtcggggg	taatcttggg	aacctttatg	ccgcgatgg	cgatatcacc	840
ctggatgcca	gcggcagact	gactgtcaac	aacagtctcg	ccacgggggc	cgtcactgca	900
aaaggctcagg	gcgtcacctt	aaccggcgac	cataaagcgg	gaggtaacct	gagcgtcagc	960
agccggagag	atatcgttct	cagcaatgga	acgcttaaca	gcgacaagga	cctcagcctg	1020
accgccggcg	gcagaatcac	tcaacagaat	gaaaaactga	ctgccggccg	ggatgtaacg	1080
cttgcccgga	aaaacatcac	acaggatacc	gccagccaga	ttaacgcggc	ccgcgatatc	1140
gtgactgtcg	ccagtgcac	gctgacaaca	cagggacaga	taaccgccgg	gcagaatctc	1200
acggccagcg	ccaccacgct	gacgcaggac	ggaatattgc	tggcgaaaaa	tcatgcggga	1260
ctcaatgccg	gtacgtgtaa	taacagtggc	gccgttcagg	gagctacctc	gacgctcggc	1320
agtacaacgc	tcagcaacag	tggctccctg	ctcagtggcg	gtccccgtgac	catgaatacc	1380
cgcgacttta	cccagagcgg	ccgcactggc	gcgaagggca	aagtggatat	catggccagt	1440
gggaaactga	ccagtacagg	tttgctggtg	acgatgcact	tggtgtgtaa	ggcgcaggat	1500
gtgacacaga	acggtgtgct	gtccggcggc	aaagggtgta	cggtcagtgc	gacgagctcc	1560
ggtaaaaaat	cggtcaccca	cagcgatgct	gcgatgacgc	tgaatgtgac	aacagtggcg	1620
ctggacgggg	aaaccagtgc	cggtgacacc	ctccgggttc	aggcagacaa	actgagtacc	1680

gcagcggg	cacaacttca	gagcggcaaa	aatctcagca	tcaacgccag	agatgcacgt	1740
cttgtaggta	cgtaggcagc	acaacagacc	atggtggtga	acgccagtga	aaagctcacc	1800
cacagcggga	aaagcagtgc	cccgtcgtc	agcctcagtg	cgccggaact	gaccagcagc	1860
ggcgtagctg	ttggttcgcg	cctgaataca	cagtcacaga	ccctgaccaa	cagcgggtctg	1920
ttgtaggggg	aggcctcact	caccgttaac	acacagaggc	ttgataatca	gcagaacggc	1980
acgctgtaca	gtgctgcaga	cctgacgctg	gatataccgg	acatccgcaa	cagcggggctt	2040
atcacccggtg	ataatgggtt	aatgttaaat	gctgtctccc	tcagcaatcc	gggaaaaaac	2100
atcgctgaca	cgctgagcgt	cagggcgacc	acgctggatg	gtgacggcct	gttgtagggc	2160
gccggtgcac	tggcgcttgc	tggcgacacc	ctctcacagg	gtagtacagg	acgctggctg	2220
acggcggcag	acctctccct	ccggggcaaa	acactgaata	ccgtagggag	cacgcaggga	2280
cagaatatca	ccgtgcaggc	ggacagatgg	gcgaacagtg	gttccgtgct	ggcaaccggg	2340
aaccttactg	cttcggcaac	cggtcagttg	accagtaccg	gcgatatcat	gatccagggt	2400
gacaccacgc	tgaaagcagc	caccacggac	aaccggggca	gtctgtcttc	ggccggcagc	2460
ctctcccttg	atggaaatcc	actggataac	cgcggcactg	tccagggtaa	ccatgtcacg	2520
attcgccaga	acagtgtcac	caacagtggc	acgctcaccg	ggatcgccgc	actgacgctt	2580
gccgcccgta	tggtcatccc	tcaacctgcg	ctgatgaata	acggagggttc	attgtgtacc	2640
agcggcgatc	tgacaatcac	cgtaggcagt	attaccagtt	ccggacactg	gcagggcaaa	2700
cggtgtctga	tcaccgcaga	cagtctggca	aacagcgggg	cgatccaggc	ggctgacagc	2760
ctgactgcac	gtctgacggg	tgagctcgtc	agcacagcgg	gcagcaaaat	cacctcgaa	2820
ggtgaaatgg	cgctcagtgc	actgaattta	agcaacagcg	gacaatggat	tgcaaaaaat	2880
ctgacctga	aggcgaaact	actgaccagt	gcgggtgaca	tcaccgggtg	ggatactctc	2940
acgctcacgg	tgaatcacag	gctgaacaat	caggcgaaac	gaaaaactgt	cagtgcagggt	3000
gtgctgacgc	tgaaggcaga	cagtgtcaca	aacgacgggc	aattacaggg	aaatgtcacc	3060
accatcacgg	caggacaact	cacaaacggc	gggcattctgc	agggcgaaac	gctgacgctg	3120
acagcctccg	gtggcgtgaa	caaccgttcc	ggtgggtgttc	tgatgagccg	gaatgcactg	3180
aatgtcagta	ctgcgacctt	gagtaaccag	agcacgatac	aggggtggag	cgggggttcc	3240
ctgaacgcca	cagaccgtct	gcagaacgac	ggcaaaatcc	tctccggcag	taacctcacg	3300

ctgacggcgc aggtgctggc gaacaccggc agcggactgg tacaggctgc caccctgctg	3360
ctggatgtgg tgaataactgt caacggcgga cgcgtacttg ccaccggcag tgacgttaaa	3420
ggaaccacgc tgaataatac cggtagcgtt cagggtgcga ctctggtgaa ttaccacaca	3480
ttcagcagcg gtaccctgct ggaacctcc gggcttggcg tcaagggcag ttactgctg	3540
caaaatggta cagggcggt gtacagtga ggcaacctgc tgcttgacgc tcaggacttc	3600
agtggtcagg ggcagtggt ggccaccggt gatgtcacac tgaaactgat tgctgccctc	3660
acgaatcatg gtaccctggc cgcagggaaa accotttccg tcacgtcgca aaatgccatc	3720
accaacggcg gtgtcatgca gggtagtgcc atggtgctcg gtgccggaga ggcattcacc	3780
aacaatggac tgactgccg taaaggcaac agtgttttca gcgcacagcg tcttttctt	3840
aacgcaccgg ttctacttca gggcggtggc gatgtgagtc tgaacacggc gagtgatatc	3900
accatcagtg gttttaccgg cacggcaggc agtctgacaa tgaatgtggc cggtagcctg	3960
ctgaacagtg cgctgattta tgcggggaat aacctgaagc tgtttacaga cgtctgcat	4020
aaccagcatg gtgatatcct ggcgggaac agtctgtggg tacagaagga tgcttccggc	4080
ggtgcaaaac cagagattat caataattcc gggaatattg agacgcatac ggcgatatt	4140
gttgtaagaa ccgggcatct tctgaaccag cgggagggat tttctgccac aacaacaacc	4200
cggactaacc cctcatccat tcagggaatg ggaatgtctc tggttgatat tcccccttc	4260
cttcttctg acggcagcta tggctatttc acccgtaagc ttgaaaatca gcacggtacg	4320
ccctgcaacg ggcacggggc atgcaatata acaatggata cgctttatta ttacgcgccg	4380
tttgctgaca gtgccacaca gcgctttctc agcagccaga acatcacaac agtaaccggc	4440
gctgataatc cggcaggccg cattgcgtca ggcgtaatc tttctgctga ggcgtaacga	4500
ctggaaaacc gggcgctatt tatcctggcg aatggggata tcgcactctc ggcgagagag	4560
ttaagcaatc agagctggca gacggggaca gagaatgaat atctggtata ccgctacgac	4620
ccgaaaacgt tttacggtag ctatgaaca ggctctctgg ataaactgcc cctgctgtca	4680
ccggaaattg aaaacaatac catcagattt tctactggatg gccgggaaaa agattacagc	4740
cccggtaaga cgtattatcc cgtatttcag gggggcgggg atgttaagac ccgttttacc	4800
agcagtatca ataacggaac aacctatgca catgcaggta gtgtcagtc ggtgtctct	4860
gcacctgtac tgaatacgtt aagtcagcag accggcgag acagctcagc acagacagcg	4920
ctgcagcagt atgagccggt ggtggtggc tctccgaat ggacagatga actggcaggc	4980
gccctgaaaa atattgccg aggttcgcca ctgaccggtc agaccggtat cagtgatgac	5040

tggccactgc	cttccggcaa	caatggatac	ctggttccgt	ccacggaccc	ggacagtccg	5100
tatctgatta	cggtgaaacc	gaaactggat	ggtctcggac	aggtggacag	ccatttgttt	5160
gccggactgt	atgagcttct	tggagcgaag	ccgggtcagg	cgccacgtga	aacggctccg	5220
tcgtataccg	atgaaaaaca	gtttctgggc	tcacgtattt	ttcttgaccg	cctcgggctg	5280
aaaccgaaaa	aagattatcg	tttctggggg	gatgcggtct	tgatacccg	gtatgtcagt	5340
aacgcggtgc	tgagccggac	gggttcacgt	tatctcaacg	gactgggttc	agacacggaa	5400
cagatgcggt	atctgatgga	taacgcggcc	agacaacaga	aaggactggg	attagagttt	5460
ggtgtggcgc	tgacagctga	acagattgct	cagcttgacg	gcagcatact	gtggtgggag	5520
tcagtcacca	tcaacggaca	aacagtcagt	gtcccgaaac	tgtatctgtc	gccggaagat	5580
atcacccctgc	ataacggcag	cgttatcagc	gggaacaacg	tgcaacttgc	gggcggcaat	5640
atcaccaaca	cgcgcggcag	catcaacgca	cagaacgacc	tctcgctcga	cagttccggc	5700
tatatcgaca	acctgaatgc	ggggctgata	agcgcgggcg	gtagctcgga	cctgagcgcc	5760
atcggggata	tcagcaatat	cagctcagtc	atcagcggtg	aaaccgtaca	actgaaaagc	5820
gtgagtggca	acatcagcaa	tatcaccccg	cgtcagcaat	ggaatgcggg	cagtgcagcg	5880
caatatggtg	gtgtgcattc	cagcggtagc	gacaccggtc	cggttgcgac	cattaaaggc	5940
actgattcac	tttcgctgga	tgacgggaaa	aacattgata	ttaccggggc	aacggtctcg	6000
tccggtggag	accttggaat	gtctcggggt	aatgatatac	acattgcccg	aaacctgata	6060
agtgaggagca	aaagtcagtc	cggtttctgg	cacactgatg	acaacagttc	atcatccacc	6120
acctcacagg	gcagcagcat	cagcgccggc	ggtaacctgg	cgatggctgc	aggccataat	6180
ctggatgtca	cggcatcctc	tgtttctgcc	gggcacagcg	ccttgccttc	ttgcagggtca	6240
cgacctagtc	ttgaatgcag	tcagggaaaa	gcaaaaacaa	gtcgcacagg	cagggtcagaa	6300
agtcataaaa	gccacgcagc	tgtgtccacg	gtgacagcgg	gcgataaact	cctccttggt	6360
gccggtcgtg	atattgccag	tcaggctgcc	ggtatggctg	cggaaaataa	cgtggtcatc	6420
cggggcgggac	gtgatgtgaa	cctggtggca	gagtcctgcc	gcgcaggcga	cagctatacg	6480
tcgaagaaaa	agaaagagat	taacgagaca	gtccgtcagc	agggaacgga	aatcgccagc	6540
ggtggtgaca	ccaccgtcaa	cgcaggacgg	gatatacccg	ctgttgctgc	atccgttacc	6600
gcaaccggca	atatcagcgt	gaatgccggg	cgtgatgttg	ccctgaccac	ggcgacagaa	6660
agtgaactatc	actatctgga	aacgaagaaa	aaaagcggag	gttttctcag	taagaaaacc	6720



acccgcacca	tcaagttagga	cagtgccacc	cgtgaagcag	gctccctgct	gtcgggggaa	6780
cgcgtagacc	ttaacgccc	tgataacctg	acggtagagg	gttcggatgt	ggtagctgac	6840
cgggatgtgt	cactggcggc	gggtaacct	gttgatgttc	ttgctgccac	cagtacagat	6900
acgtcctggc	gctttaagga	aacgaagaaa	tccggtctga	tgggtaccgg	cggtattggt	6960
ttcaccattg	gcagcagtaa	gacaacgcac	gaccggcgcg	aggccgggac	aacgcagagt	7020
cagagtgcc	gcaccatcgg	ctccactgcc	ggtaattgtca	gtattaccgc	gggcaaacag	7080
gctcatatca	gcggttcgga	tgtgattgcg	aaccgggata	tcagcattac	cggtgacagt	7140
gtggtggtg	acccggggga	tgaccgtcgt	actgtggacg	aaaaatttga	gcagaagaaa	7200
agcgggctga	cggttgccct	ttccggcacg	gtgggcagtg	ccatcaataa	tcgggttacc	7260
agtgacacag	agacgaagga	gagcagtgac	agccgtctga	aagccctgca	ggccacaaag	7320
acagcgctgt	ctggtgtgca	ggccggacag	gctgcgacaa	tggcctccgc	aaccggtgac	7380
ccgaatgcgg	gagtcagcct	gtcgcctacc	accagaaaat	cgaatcaca	acaacattct	7440
gaaagtgaca	cagtatccgg	cagtacgctg	aatgccggga	ataatctgtc	tgttgcgca	7500
accggcaaaa	acagggggca	taaccgcgga	gatattgtga	ttcaggaag	ccagcttaag	7560
gccggtggt	acacaagcct	ggatgccgcg	aatgatattc	tgttgagtgc	ggccgcaaac	7620
acacaaaaaa	caacggggcg	gaacagcagc	agtggcggtg	gcgtgggtgt	cagtatcggt	7680
gcaggtaaa	gtgccggtat	cagcgccctt	gccagcgcta	atcgcgcaaa	aggcagggag	7740
aaaggtaacg	gtactactac	cgacaaaacc	gtcaccatca	acagtggtcg	ggatacggta	7800
ctgaacggtg	ctcaggtcaa	cggaacacag	attatcgccg	atgtgggcca	cgacctgtg	7860
ataagcagcc	agcaggacac	cagtaagtac	gacagtaa	agaccagcgt	ggctgccggc	7920
ggcagtttta	cctttggctc	catgaccggc	tcaggttaca	tcgctgcctc	ccgggataag	7980
atgaagagcc	gctttgactc	cgttgtgtga	caaaccggaa	tgtttgcccg	gggtatggtg	8040
gcttcgacat	cacagtgggt	aaacataccc	aactggatgg	tcgggtcatt	gcctcactgc	8100
cacaccggag	aaaaaccacc	tggataccgg	acgctgggtt	tagtgacttt	acaacgaagc	8160
gggattataa	agtcaagtca	caggtggaat	cagttctga			8198

<210> 110  
 <211> 963  
 <212> DNA  
 <213> *Escherichia coli*

<400> 110

atgatgttga agaaaaacgat atttatatta acgttattct ctggcaacgt aattgctgca	60
actgtagaat taggttttga aaatgagcaa tataattatg cttatcgttc tgcagatgtc	120
ttcatgccgt atattaagag taatttcaac cctgttactg attctgcttt gaatgtgtca	180
ctcacctata tgtatcagga tcaatatggg aaaaaacata aaaaaacatc tgaggacaga	240
tttaaaacca atcgcgatcg catagagctc tatctttaaag gttatacttt aaatagggga	300
gcataattctt tttctccttc cgcaggtttc cgttatgagt catgggatgt aaactacgat	360
aatccgaaaa agcaggataa gtggaaactg gaactacgct tttatcctaa tatgacttat	420
aaactcaatg accagttaag cctatatatg aatgggtttg ttgccctgt attttttaaa	480
acacaacaag agtcgagaaa agataacaat tatgtaaagg gtaagttagg ggcgaaacgt	540
tataacaacg atttatatca ggaactccag attctgggtg tcagatataa atttaataat	600
gataatacgc tctgggcatc agtctataat gaaagaaaat ataataca ttcctcaaaa	660
tatgatcgct ggcaattgcg tggaggctat gattttaaag ttacagagga gtttgttttg	720
agtcatttca taagatatga cctctcttat agagaaaaaa acctcgaaag cacaagtaat	780
aatggtttat caaaaaataa taaagaaatt cgaactggag ccagcttttc ctataaaatt	840
atccctcttg taaaactggt aggagaaata tacaggcaaa caaccaacat tgaaaactat	900
tatggagagc attctgaaga caaaaaccgc atgttctaca aacttgggat aaacaaaaca	960
ttt	963

<210> 111  
 <211> 1761  
 <212> DNA  
 <213> *Escherichia coli*

<400> 111

atgcagcacc ggcagaaaaa cattctgacg aaaacgtccc ttttatcccg tgcgttgtct	60
gtccccgtgt gtgatatgtt ccggcgcggc tctccgtgga tatgctatct ctccctctcc	120
gttttttctg gttgtttcat ccccgattt tctctccgg cagccatgct gtctccgggt	180
gaccgcagtg caattcagca gcaacagcag cagtgtctgg atgaaaacca gcgtcagcgt	240
gatgcgctgg agcgcccgtc gaccatcacg ccgtctccgg aaacgtctgc cggtagtgaa	300
ggtccctgtt ttacggtgtc aagcattgtt gtcagtgggg ccaccgcact gacgtctgca	360
gaaaccgaca gactggtgcc gtgggtgaat cagtgtctga atatcacggg gctgaccgcg	420

gtcacggatg	ccgtgacgga	cggctatata	cgccggggat	atatcaccag	ccgggccttt	480
ctgacagagc	aggacctttc	agggggcgta	ctgcacataa	cggtcatgga	aggcaggctg	540
cagcaaatcc	gggcggaagg	cgctgacctt	cctgcccgca	ccctgaagat	ggttttcccg	600
ggaatggagg	ggaaggttct	gaacctgcgg	gatattgagc	aggggatgga	gcagattaat	660
cgtctgcgta	cggagccggt	acagattgaa	atatcgcccc	gtgaccgtga	gggatggctg	720
gtggtgacac	tgacggcatt	gccggaatgg	cctgtcacag	ggagcgtggg	catcgacaac	780
agcgggcaga	agagtaccgg	tacggggcag	ttaaattggtg	tcctttcctt	taataatcct	840
ctggggctgg	ctgacaactg	gtttgtcagc	gggggacgga	gcagtgactt	ttcggtgtca	900
catgatgcga	ggaattttgc	cgccggtgtc	agtctgccgt	atggctatac	cctgtgggat	960
tacacgtatt	catggagtga	ctacctcagc	accattgata	accggggctg	gcggtggcgt	1020
tccacgggag	acctgcagac	tcaccggctg	ggactgtcgc	atgtctctgt	ccgtaacggg	1080
gacatgaaga	cagcactgac	cggaggtctg	cagcaccgca	ttattcacia	ttatctggat	1140
gatgttctgc	ttcagggcag	cagccgtaaa	ctcacttcat	tttctgtcgg	gctgaatcac	1200
accacaagt	ttctgggggg	ggtcggaaca	ctgaatccgg	tattcacacg	ggggatgccc	1260
tggttcggcg	cagaaagcga	ccacgggaaa	aggggagacc	tgcccgtaaa	tcagttccgg	1320
aaatggctcg	tgagtgccag	ttttcagcgc	cccgtcacgg	acaggggtgtg	gtggctgacc	1380
agcgccttatg	cccagtggtc	accggaccgt	cttcattggtg	tggaacaact	gagcctcggg	1440
ggtgagagtt	cagtgctgtg	ctttaaggat	cagtatatct	ccggtataaa	cggcggttat	1500
ctgcggaatg	agctgtcctg	gtctctgttc	tcctgccat	atgtgggaac	tgtccgtgca	1560
gtggtgcac	tggacggcgg	ctggtgcac	tctgacagcg	atgacccgta	ctcgtccggc	1620
acgctgtggg	gtgctgtctc	cgggctcagc	accaccagtg	gccatgtttc	cggttcgttc	1680
actccgggac	tgctctgtgt	ttaccgggac	tggttggccc	ctgacctctc	cacgggtttac	1740
tggcgcgttg	ccgtcgcgtt	t				1761

<210> 112  
 <211> 2220  
 <212> DNA  
 <213> Escherichia coli

<400> 112						
atgaataaagc	acacactatt	actgactgtt	ctttttctga	atttgatttg	tactcccggtt	60
tttgctcaaa	actggcagggt	ggcgacgttt	ggtcagtcta	cggatctcaa	cttttcatcg	120

ctgatagatt	cggcccaagat	cggcacggaat	aatgcctggc	ttgcaggaaa	caataatttt	180
cttgaagctg	gaaaatttta	cactttacca	acagattttt	ttattgaaag	ccgtggggga	240
aaaattgcta	actcccatga	cggtatgacc	gtcttttata	ctattgttcc	ggttactcag	300
acattccgac	tggaggctga	tttgacatta	gaacagattg	gtccggaggt	gaatggaaaa	360
tcaccagcgg	gacaggaggg	agctggattg	ttgtcagag	atattatcgg	tcctcagcga	420
caggaaacct	agtcagctgg	aacagaagaa	tatccccagg	cctctaatat	attgatgaat	480
gcctttatta	cacagaataa	aaagaatgat	aacttagtac	agattacttc	aattgttcgt	540
gaaggagtaa	taaaaacatg	gggtaatgaa	ggtattacaa	ttaagaaaca	gcgatcatt	600
gagaatataa	actttacgca	aaaaagaaat	attcatatga	cgatcgagcg	actaccagag	660
aagttcatcc	tgaccgcttt	tgataccgat	cgtaaagaaa	atcagtcatg	gcaattttct	720
gattactcag	gctttatgaa	tcaactggat	aataatagtt	tagctattgg	tttttttgcc	780
gcacgaaatg	cgaaactaag	ggtgaaaaat	gcatcattta	aaccgggcaa	gccactgggt	840
gattacaaac	aattaacttc	acgtcaatcc	agtcgtgtcc	ggcataaagc	ccctgaactt	900
tttcttgctt	cacctcaatc	cgttgtaaga	aactcaacaa	ctcttcaatt	tttgccaat	960
caggctggaa	tagtcagtat	tgataatgat	aagcagacta	agcaggtgca	ggcgggtgaa	1020
ctggtacagt	ttccagttac	tttgcaaaaa	aaacataatg	acttcaccgt	caactttaac	1080
gttgatggga	atatatcaaa	aaaagctata	cgcatagagc	aggttaaatc	aaacctgact	1140
gatccttatg	agatttacgt	atgtagtgat	tgtcgacagg	gggccagagg	cagcaaaaaa	1200
gacctgttag	atttacagac	agccgtaaaa	ttgtcgcac	ccggcggtaa	tatatacctt	1260
aacgatggtc	aatatcatgg	aattacctta	gacgggaat	taagtggaat	acctggcaag	1320
tataaaacaa	ttttcgccat	taatccacat	aaagccattt	ttataaacia	gacattcaat	1380
ctggatgcaa	gttactggca	tctaaaaatc	gtggtctttg	acggcaatgt	ggataatgga	1440
aataataaac	cagcatattt	gcgtatagct	ggtagctata	atattattga	gcatgtgata	1500
gccagaaata	atgatgatac	gggaattttct	atttcagcga	aagataaaaa	ccgttttttc	1560
tggccagctc	ataacttagt	tttaaaactca	gattcatata	ataatcttga	tttatccggg	1620
attaatgccg	atggttttgc	tgcaaaaatta	ggtgtcggac	cgggaaacat	ttttcgagga	1680
tgcattgcac	ataataatgc	agatgatggg	tgggacctat	ttaacaaaaa	tgaagatggg	1740
ccaaatgcat	ctgttactat	tgagaattct	gtagcctatg	aaaatggcct	gccatacaat	1800

aaagcggata	tctctaaaagg	gagtattggc	aatggcgggtg	aaggtcaacc	cagtaaatca	1860
caagttatta	attccattgc	tattaataat	aatatggatg	gatttcactg	taattttaat	1920
actgggtcat	tgatagttag	aaataatata	gcaatgaaca	atgcacgcta	taattatatt	1980
ttaagaacta	accatataa	attcccatca	tctatccttt	ttgataataa	ttattcaatc	2040
agagatgatt	gggaaaaata	aataaaagac	ttcttaggtg	atacagttaa	cagtgtgaat	2100
tataaattgc	ttgtttcaca	tgaaacagga	ccggtacaaa	aagatttatt	ttcacacga	2160
gatgatagtg	gaaatattat	ctatcctgat	ttttttctta	atatcattaa	taaatttaat	2220

<210> 113  
 <211> 408  
 <212> DNA  
 <213> *Escherichia coli*

<400> 113						
atgaaaactt	tatatcaaac	tttactcgtt	gctgtaacta	ttctgttctc	tgctcttgc	60
acggcgaaac	aagtaaaact	gccaaaacac	atcaaatatg	ttaatactac	agaggcggtt	120
tcctgtactg	agattgacgg	tatgaattgc	cagacgaaga	atccgtttaa	ctataaagat	180
aacagctatg	ttttcgtgct	tgaacgtggt	ggtgcctggt	gttacgacta	cactgtctcg	240
gtacttaacc	tgaaaaccgg	gaaagcacag	atgctcgaat	acaagacaaa	ccagctgtgc	300
tcaggtagca	acaaaccgtt	cttcgaaatc	aaaaatggcg	taccgacggt	aggagtcac	360
gacacatccg	gaaaacctgt	cggtgtggct	ctggacaaac	ttaaaacc		408

<210> 114  
 <211> 675  
 <212> DNA  
 <213> *Escherichia coli*

<400> 114						
atgcaattac	ctgtaaaagt	attaatgagc	cttatatctc	tggtcagcgt	tattgcacgt	60
gccgggaaat	ataaaaaata	catccgggat	gaaataaaat	actggcgata	tacatcatac	120
aagggggggg	aatttccgga	aggtttcact	gatgagaaat	tttccagcgc	cattttacaac	180
ggaagaatat	ttacaatgaa	acgtttacat	accctgatgt	tattttctgg	ggttctgttt	240
actggcttta	acgtggaagc	agcgagcgtg	aaacaagcgc	tcagctgcga	cccaaagcc	300
cgggctgaac	aacctggagc	gtgtccaaca	acgtacgagt	tgtagcaagg	tgacgtgcc	360
tacaaagctg	cgcttgacaa	agcattaaaa	ccggtcggac	tgagcggcat	gttcggtaaa	420

ggcgggtata tggatggccc tggcggaaac gtaacgccag taaccattaa cgggtacagtc	480
tggctccagg gcgacgggttg caaagccaat acctgcggct gggactttat cgtaacactc	540
tataaaccaa aaaccatga agtcgttggc taccgctact ttggtttaga tgacccggcc	600
tacctggttt ggttcggcga aattggcgtg catgaattcg cgtatctggt gaaaaactac	660
gtagctgcgg ttaac	675

<210> 115  
 <211> 2163  
 <212> DNA  
 <213> *Escherichia coli*

<400> 115	
atgaaaactc aaataacttt cgctgcgctt ttgccagcat tagcgtcttt cataccgctt	60
catgctcatg cctcgtctac ttctgaagat gaaatgattg tcacgggcaa caccgccgcc	120
gacaccaccg attctgccgc cggtgccggt ttcaaaacga acgatataga tgtcgcccg	180
ctgggaacga aatcctggat cgaaacacca tattccagca ccactgttac taaagagatg	240
attgaaaatc agcagcgcca aagcgtcagc gagatgctga aatactctcc cagtacgcaa	300
atgcagcgcg cgggtggaat ggatgtcggg cgtccgcaaa gtcgggggat gcagggcagc	360
gtggtggcca acagccgtct ggacgggctg aatatcgttt caacaaccgc gtttcgggtg	420
gaaatgcttg agcgcatgga tgtgcttaac agtttgaccg gcgcgctgta cggcccggcg	480
agcccagcag ggcagtttaa ttctgtggcg aagcgcccaa ccgaagagac gctgcgtaaa	540
gtgacgctgg gctatcaaag ccgcagtcg tttaccggcc atgccgatct ggggtggccat	600
tttgatgaaa acaaacgggt tggctatcgc gtgaacctgc ttgatcagga aggggaaggc	660
aatgtggatg acagcacgct gcgtcgcaaa ctcgtttcgg ttgcgctcga ctggaatat	720
cagccgggca ctcagctaca gctcgacgcc agccattacg aatttatcca gaaaggctat	780
gtcggtagct ttaactatgg gccgaacgtc aaactgccgt ctgcgccgaa tccgaaggac	840
aaaaatctgg cgctcagcac tgcgggcaac gacctacta ccgataccat cagcactcgc	900
ctgatccact actttaacga cgactggtcc atgaacgctg gcgtgggctg gcagcaggct	960
gaccgcgcga tgcgtagtgt ttccagtaaa atactcaaca atcaggcgca tatctctcgt	1020
tcgatgaagg attccaccgc tgccggacgt ttctgcgtcc tgagcaacac cgcggggctg	1080
aatggtcata ttgataccgg ctctatcggc cacgatctgt cactttctac cacgggatat	1140

gtctggtcgc	tttatagtcg	caaaggaaca	ggttccagct	atagctgggg	tacaacaaat	1200
atgtatcacc	cggatgcgat	agatgagcag	ggcgatggca	aaatccgcac	cggcgggccc	1260
cgataccgct	ccagcgtaaa	tactcagcag	agcgttacgc	tcggcgatag	ggtgacattt	1320
acgccgcagt	ggtcggcaat	gttctatctc	agccagagct	ggctgcagac	taaaaactac	1380
gataagcacg	gtaatcaaac	gaaccagggt	gatgaaaatg	gtttaagtcg	gaacgccgcg	1440
ctgatgtata	aaattacccc	taacacaatg	gcctacgtta	gctatgccga	ttcgctggag	1500
cagggcggtg	ccgcaccgcg	ggatgagagc	gtaaaaaatg	ccgggtcaaac	gctaaacccg	1560
tatcgcagca	agcagtatga	agtgggggta	aaatcggaca	tcggcgagat	gaatctaggc	1620
gccgcgctgt	tccgactgga	acgtccggtt	gcctatcttg	atcgggataa	cggtgtataa	1680
gagcagggta	accaggttaa	caacggcctt	gagttaaccg	ctgccgggaa	tgtgtggcag	1740
gggctgaata	tttacagcgg	cgtgaccttc	ctcgaccgga	aactgaaaga	tacggcgaat	1800
gcctcaacca	gcaataaaca	ggttgtcggc	gtgccgaaag	tgcaggccaa	tctgttggcg	1860
gaatacagtt	tgccgtccat	accggaatgg	gtttacagcg	ctaactccca	ttatacgggc	1920
aaacgcgcgg	cgaacgatag	caacacctct	tacggcagca	gctataccac	atgggatttg	1980
ggaacgcgtt	acaccaccga	agtgagcaac	gtcccaacca	ctttccgcgt	ggtgtgtaac	2040
aacgtgtttg	ataaacatta	ctgggcttct	atcttcccat	cgggtaccga	tggcgataac	2100
ggttccccaa	gtgcgtttat	cggcggcggc	cgcaagtgct	gtgcatccgt	caccttcgat	2160
ttc						2163

<210> 116  
 <211> 2007  
 <212> DNA  
 <213> Escherichia coli

<400> 116	
atgaaaaaca	taacgctgtg
gcagcgttta	agacagggtc
gtatcagtac	cagcttacgt
60	
tgcgcatctt	tgatgggggc
acttctgacc	ctgattgtca
gtagtgtcag	tctgtattca
120	
tgggcatgaac	aaagctcaca
aattcgtttc	tcgctggata
agatattttc	ccgtattcac
180	
tctgctttcc	ttattgaagg
gaacctgaat	ctggtggtag
accagctaaa	tgaatttttg
240	
caggctccca	acaccaccgt
gcgattgcaa	cttcgtaccc
agattattca	gcattctcgac
300	
accatagaac	ggcttagtag
gggactgtca	tccgggaac
gccaaacact	gacggtcatt
360	
ttgcaggaca	gtcgatcact
gttatccgag	ttggatcgtg
cgctttacaa	catgttttta
420	

ctacgggaaa aggtgagtga gctatcagcg cggattgact ggttacacga tgattttact	480
accgagctta attctttagt gcaggatttc acctggcagc agggaacgct gctggatcaa	540
atcgccctccc gacagggcga tacggcgcaa tacctgaagc gatctcgtga agtgcaaaat	600
gaacagcagc aggtttatata cctggcacgc attgaaaatc agattgttga cgatctgcgt	660
gacagactca atgagctcaa atcaggacgt gatgacgaca tacaggtgga aactcatctc	720
cgttattttg aaaatctgaa aaaaacggca gatgaaaata tacgtatgct ggatgactgg	780
cctggcacca ttaccctgag gcagaccatc gatgaattgc tggatatggg aatcgtaaaa	840
aacaaaatgc cggatacga cgtgaatat gtcgcccgc aaaaagcctt agaggatgcc	900
agtcgcacca gggaagcgac acagggtcgc ttcagaacgt tactggaagc gcagcttggc	960
agtactcatc aacaaatgca gatgtttaat caacgaatgg aacaaattgt tcacgttagc	1020
gggtgggtga tctctgtggc gacagcactg gcgttactgc ttgcatgggt attcaaccat	1080
tattttatcc gctcacggtt ggtgaaacgc tttaccctac tgaatcaggc cgttgtgcaa	1140
attggtctgg gaggcacgga aacgactatt ccagtttatg ggaatgatga actggggaga	1200
attgcaggat tattacgcca tactctcgcc caactcaatg tgcaaaaaca gcaacttgaa	1260
caagaaatta ccgatcgtaa ggtgatagaa gccgatctgc gtgccacca ggacgaactg	1320
attcagacag caaagttggc ggtagtcggg caaacgatga ccacgctggc ccacgagatc	1380
aatcagccgc taaatgcgct gtcaatgtat ctgtttacag cccgcagggc cattgaacag	1440
accagaaaag aacaggccag catgatgctt ggtaaagccg aaggggtgat tagtcgtatt	1500
gacgccatta tccgttcact acggcagttt acccggcgcg ccgaactgga aacatcactc	1560
catgccgttg atttagcaca gatgttcagt gcggcctggg aacttctggc catgctcat	1620
cgctctctgc aagctacgct tgttctgcgg caaggtagag ccacagtttc aggtgatgag	1680
gtcagaacct agcaggctact ggttaacgta ctggcgaatg cgcttgatgt ttgtgggcaa	1740
ggcgctgtca ttaccgttaa ctggcaaatg cagggtaaaa cgctgaacgt attcattggc	1800
gataatggcc cgggctggcc tgaggcattg ttgccttcgt tattgaagcc gtttaccacc	1860
agtaagaag taggactggg tattggtctt tcaatttgtg tgcgttgat ggagcaaatg	1920
aaaggggaat tgcggctggc atcaacgatg accaggaatg cctgtgtggt actgcaattc	1980
agactaacgg atgtggaaga tgctaag	2007



<211> 2259  
 <212> DNA  
 <213> Escherichia coli

<400> 117

atgaacgtta taaaactggc tatcggctca ggcataattat tgctcagctg cgggtccttac	60
tcacaatcca tcagtgaaaa aactaattcc gacaaaaaag gagcggcaga attcagtcgcg	120
ctcagcgttt ctgtcgggaa gacgaccagt gagcaggaag ctctcgagaa aacaggcgcg	180
accagttccc ggacaacgga caaaaacctg caatcacttg acgcaacagt gcgtagtagt	240
cctggtagctt atactcaaat agatcctggt caggagagcaa tcagtgtaga tattcgaggc	300
atgagcggat ttggtcgtgt aaacactatg gtcgatggta ttaccagag tttttacgga	360
acctctacct ccggaacaac gacgcatggt tcaactaaca atatggctgg cgtacttata	420
gatcctaact tactggtagc agttgatgtt acacgcggtg acagcagtggt ctctgaaggg	480
atcaacgccc ttgcccgtag tgcaaatatg cgtactattg gcgttgacga tgtaatat	540
aacggtaata catatggcct tcgttcacgt ttctctgtcg gtagtaatgg gctgggacgc	600
agcgaatga tcgcccttgg tggaaaaagc gacgctttta cggatacggg aagcattggc	660
gttatggctg ctgtgagcgg cagttctgtg tactctaatt tctcaaatgg ttctggaatt	720
aacagcaaaag agtttggtta tgataaatat atgaagcaga accccaatc ccaactgtat	780
aaaatggata tcagaccaga cgaatttaac agcttcgaac ttccgcctcg aacctatgaa	840
aataaattta cacgtcgtga tataaccagt gacgactatt acattaaata tcattacacc	900
cctttttctg aattaattga ctttaacgta acggccagta ccagtcgcgg taatcaaaag	960
tatcgtgatg gctcgtgtga tactttctac aaaacctcag cgcaaaatcg ttctgacgcg	1020
ctggatatca acaataccag ccggttcaact gtcgcgagaca atgacctgga gtttatgctg	1080
ggcagcaaac tgatgcgtac ccgctatgac cggaccattc actcagcgcg gggcgaccgg	1140
aaagcgaatc aggaatcgat cgagaacaat ccgttcgcac cctccggcca gcaggatatt	1200
tcagcgctgt ataccgggtg gaaggttacg cgcggcatct gggaggcaga tttcaatctc	1260
aactacacac gtaacaggat cacagggtac aagcccgctc gcgattcacg cgttatctgc	1320
gtgccacagg gtagctacga tattgacgat aaagagggtg gcttcaacct ttcagttcag	1380
ctttctgctc aggttaacacc atggcttcag ccgttcattg gctacagcaa atccatgcgc	1440
gccccgaaca tccaggagat gttctctctc aattcaggag gcgcatccat gaacccattc	1500
ctgaagcctg aacgtgcaga aacctggcag gcgggtttta acattgatac cagagattta	1560

ctggtcgaac aggatgccct gcgctttaag gctctggcgt accgcagcag gatccagaac	1620
tacatctaca gcgagtctta tctggtttgt tctggaggtc gtaaatgcag tctgcctgag	1680
gtgattggca atggctggga gggcattagc gatgaataca gcgacaatat gtacatctac	1740
gttaactcgg caagcgacgt tatcgcaaag ggcttcgaac tggagatgga ttatgatgca	1800
ggttttgctt ttggccgact ctctttcagc cagcagcaaa cagaccagcc aacctccatc	1860
gccagcacc cactttggcg aggggatata accgaactgc ccagaaaata catgacgctg	1920
gatactgggtg ttgccttctt cgataacgcg ttgaccttgg gcactatcat aaaatacaca	1980
ggcaaggctc gtgcctgtgc gcctgatatt gagcaggacg aacataccgg cgcaataatc	2040
aaacaggatt tgccgcagat cccaacgatt atcgatctct atgggtactta cgagtacaac	2100
cgcaacctga cactgaaact ttcggtacaa aacctgatga acagagatta ttcggaggcg	2160
ctgaataagc tcaacatgat gccaggctct ggtgacgaga cccaccagc caattccgcg	2220
cgtggcgagaa catggatatt tggcggggac attcgtttc	2259

<210> 118  
 <211> 399  
 <212> DNA  
 <213> *Escherichia coli*

<400> 118	
atgtcttcga aaacaaaatg ctggctatgg atgttactgg tcatcctttc tgaaacctct	60
gcaacatcca cacttaaaat gttcgataac agtgagggga tgacaaaaac gctgctgctg	120
gccctaactg tcgtactgta ttgcatttgt tactactcgc ttccacgggc agtaaaagat	180
atccccgttg gtctggctta cgccacatgg tccggtactg gcattttgat ggtttcaacc	240
cttgggattt tattttacgg tcaacacccg gataccgccc ccattattgg tatggtcac	300
atagccagcg gtattatcat tatgaatctg ttctcaaaaa tgggcagtga agaggcgga	360
gaaactccag ttaccaacct cgataaaaaa atcgctaac	399

<210> 119  
 <211> 858  
 <212> DNA  
 <213> *Escherichia coli*

<400> 119	
atgtatataa aaaagcactg gatagcttta tccattctat taataccttg cattggaaac	60

gctcagga	aa	ttaaaattga	tgaagctgg	ttacatcaaa	gcttgaatgt	cattggctgc	120
acagactctc	gctttggccc	aagactgact	aacgacctct	accctgaata	tactgtagca		180
ggaagaaaag	actggtttga	tttttatggt	tatgttgatc	taccgaaaat	ctttggcgtc		240
ggcagtcact	atgatgttgg	gatctgggat	gagggctcac	cactatttac	ggaaatagaa		300
cctcggtttt	ccattgacaa	attgaccgga	ttaaatcttg	cgttcgcccc	atttaaagaa		360
tggttcattg	caaaacaacta	tgtctatgat	atgggtgaca	accagtcac	ccggcaaagt		420
acatgggata	tggggcttgg	tacagatata	gacacgggto	taccaattaa	gctttctgcc		480
aatatatacg	ccaagtatca	gtggcaaaac	tatggtgccg	ctaataaaaa	tgaatgggac		540
ggatatcgat	tcaaaataaa	atatagcatc	cctcttaca	atttattcgg	aggacgattg		600
gtatacaata	gttttactaa	ctttgatatt	ggctccgata	ttgcggacaa	gtcacacaat		660
aataaacgaa	ccagtaatgc	tattgcttca	agccatatcc	ttccctctct	atatgaacac		720
tggaaatttg	catttacact	acgttatatt	cacaacgggt	gacaatggaa	tgcgggagag		780
aaggttaact	tcggagatgg	tccatttgaa	ttaaaaata	caggatgggg	aacctatact		840
actattgggt	atcaattt						858

<210> 120  
 <211> 516  
 <212> DNA  
 <213> *Escherichia coli*

<400> 120						
atgagaatcg	caccgcgtac	cttctttgct	atttccgccc	tggcgtttat	tgtcgctcc	60
ggatttagtt	tctggcggtt	gtcccctgct	gaaaatacac	ggattatgag	ttgttcaaca	120
aaaggcatca	tgcgttttga	gaatatggaa	aaggagaacg	ttaacggtaa	tattcacttt	180
aactttggca	gccagggtaa	aggttcgatg	gtgctcgaag	gctacacgga	ctctgccgct	240
ggctggctgt	acctgcaacg	ctatgtcaaa	ttacctata	ccagtaaacg	tgtttccgcc	300
acggaacgcc	attaccgcac	cagccagtgg	gaatccagcg	cctcatcgat	agatgaatca	360
ccagatgtga	tttttgacta	ctttatgcgt	gaaatgtctg	acagccatga	cgggctgttc	420
ctcaacgccc	agaagctgaa	cgataaagcg	attttgctca	gttctattaa	ttcaccgctt	480
tggatctgta	cccttaaate	tggcagcaaa	ttagac			516

<210> 121  
 <211> 546

<212> DNA  
<213> Escherichia coli

<400> 121

atgaaaataa aagttatagc attggctaca tttgtttctg ctgtgtttgc tggttcagct	60
atggcctatg acggaacaat tacgtttacc ggtaaagttg tagctcagac ctgcacagtt	120
aatacaagcg acaaagactt agcagtaact ttacccactg ttgccacttc atctctaaaa	180
gacaatgctg ctacgtcagg gctgacaccc tttgccattc gtttaactgg ttgtgcaact	240
ggatatgaata gtgctcagaa tgttaaagcg tactttgagc cttcaagtaa cattgactta	300
gctacacata atttaaaaaa tactgtctact ccaactaaag cggataatgt acagattcag	360
ttgctaataa gtaatggaac ttcaactatt cttttggggg aagcggataa tgggcaagat	420
gtccagctcg agacaatcgg atctgatgga agtgccacat tgcgttatat ggcccagtat	480
tatgcaacag gacaatctac cgcaggggat gtaaagcga cgggtccatta taccattgcc	540
tacgaa	546

<210> 122  
<211> 1077  
<212> DNA  
<213> Escherichia coli

<400> 122

atgaaaagaa tctttttcat accattggtt ttaattttac tcctaagct ggcggtagcg	60
ggtcgggatg attatgtgcc ttcgcagata gcggttaata catccacatt gccagggtgtt	120
gtgattggtc ctgctgatgc ccatacctat ccccggtga taggagagct ggcgggaaca	180
agtaaccagt atgttttttaa tggcggtgcc atcgctctga tgcgtggaaa gtttaccccc	240
gcactgccta aaattggaag tattacggtg tactttccat caaggaaaca gcgtgattca	300
tctgattttg atatctatga tattggtgta tccggactgg gtattattat tggcatggcg	360
ggctattggc ccgcaacgco tctggtcccc ataaatagct caggatataa tattgacctt	420
gtagggtgcca atacaaaccc caatacttat aacgggtgca cagcaagctt cggagctcgt	480
ttgtttgttg cttttgtcgc aacggaaga ttacccaatg gatataaac aatacccacc	540
aggcagcttg gtactatttt gttggaagca aaacgtacaa gtttaataa taaaggactg	600
acagcacctg ttatgtttaa tgggtggcgc attcagggtac agagtcagac atgtaccatg	660
gggcaaaaaa actatgtggt gccattaaat accgtatatc aatcacagtt cacatctttg	720

tataaagaaa	tacagggagg	taaaattgac	atacacctac	aatgcccgga	tggaattgat	780
gtttatgcta	cattgacaga	tgcatcacag	ccagtgaaca	gaacagatat	attgacctta	840
agcagtgaat	ccactgcaaa	aggatttggc	atcaggctat	ataaagacag	tgatgtaact	900
gccatcagct	atggtgaaga	ctcccctgtg	aaaggaaatg	gcagtcaatg	gcacttctcc	960
gattacaggg	gagaggtaaa	tccacatatc	aatttaagag	ccaattatat	aaaaattgct	1020
gatgcaacta	cacctggaag	tgtgaaggct	attgcaacta	ttactttctc	atatcaa	1077

<210> 123  
 <211> 2532  
 <212> DNA  
 <213> Escherichia coli

<400> 123						
atgaacgcta	ataatctgtc	atgcctgatt	tactgtcggt	gttctcttct	gctttttgct	60
gcattagggg	taacagtaac	aaaccattca	tttgctgctg	aagaggctga	gtttgattct	120
gagtttttgc	atttggataa	agggataaat	gctattgata	tccgcgcgct	tagtcatggt	180
aacctgtgct	ctgagggcag	gtattattct	gatatttatg	ttaataatgt	atggaagggg	240
aaggctgatt	tgcagtattt	acgtactgcc	aataccgggtg	ctccgacgtt	atgcctgacg	300
cctgagctgc	tttcattgat	tgatttagtc	aaagatacta	tgtcgggaaa	cacctcctgc	360
tttccgpgct	caacagggct	ttcttcagcc	agaattaatt	ttgacttatt	gactttaagg	420
ttgaatatcg	aaatccctca	ggcactgctg	aatacacgtc	caagaggata	tatttccctc	480
gctcagtgcc	aaagtgggtg	tcctgcagca	tttataaact	atgatgctaa	ctattaccag	540
tatagctctt	ccgggacagag	taacgaacag	acttatctgg	gattaaaacg	tggtattcaat	600
ttgtggggat	gggctttgag	ccaccgtggc	agtgagagct	ggaataatag	ctatcctgcc	660
ggatatcaga	atatagaaac	aagtataatg	catgaccttg	ccccattgag	agcacaattc	720
acattagggg	atttttatag	gaatgggtgag	ctaattggata	gcctcagttt	gcggggagtc	780
agggttagcat	cggatgaacg	aatgttacct	ggctctttac	gtggctatgc	tcctgctgtc	840
cggggaatag	ctaacagtaa	tgctaaagta	accatttatc	aaaatgctca	tatcctctat	900
gaaacgcagc	tgccagccgg	accattttgc	atcaatgatt	tatatccagc	tggtatagct	960
ggtagacctc	tcgttaagat	aacagagtct	aatggccaga	cacgaatgtt	cacgggtcct	1020
tttgcggccg	ttgctcaact	cattcgtccc	ggatttagtc	gctggcaaat	gtcagtgggg	1080
aagatcggtt	atgcgaataa	aacatataat	gatttaatat	cacaaggcac	ctatcaatac	1140

ggcctgacga atgatattac tttaaacagt ggtcttacca cagcttcagg atatacagcg	1200
gggttagctg gcctggccct taatacccct ctgggtgcta tagcatctga cattacattg	1260
tccagaacag cattcaggta ttcgggtgta acgcgtaaag gttatagtct gcactcaagt	1320
tatagcatca atattccagc ctcaaacaca aatataactc tggcggtcta tcgttattca	1380
tcaaaagatt tttatcatct gaaggatgcg ctatcagcta atcacacgcg gtttattgat	1440
gatgtttctg taaaaagtac agcgttttat cgtcccagga atcaattcca gatttcaatc	1500
aaccaggaat taggtgaaaa atgggggtgg atgtatttaa caggaacaac ctataattac	1560
tggggacata aaggaagtcg taatgaatac cagattgggt acagcaactt ctggaacaa	1620
ctcggctatc aaattggatt gtctcagtca agagataatg agcaacaacg ccgtgatgac	1680
agattttata ttaattttac tctccctctg ggaggaagtg ttcaaagccc ggtgttttcc	1740
actgttttaa attatagcaa agaagagaaa aatagtattc agacatcaat tagtggtagt	1800
ggcggggagg ataatcagtt ctcttatggt atttcaggaa acagccagga aaacgggcct	1860
tccggttatg caatgaatgg gggttatcgt tcaccttatg taaataaac cacaacagtc	1920
gggcatgata ctcagaataa taatcaaagg tcatttgggt cgtcgggagc ggtggtcgca	1980
cacccttatg gagtgcatt gagtaatgac ctgagtata cttttgccat tatccatgct	2040
gaaggagctc agggggctgt catcaataat gcctctgcta gtcgtctgga tttttgggga	2100
aatggtgttg ttcttatgtg tacaccctat gagaaaaatc aaattagcat cgatccctcc	2160
aatttagatt tgaatgttga attatcggcg acggagcagg aaatcattcc tcgtgcta	2220
agcggcacgt tagtgaaatt tgacactaaa acaggaagaa gtctgttatt tgatattcgt	2280
atgtctactg gcaatccccc tccaatggct tctgaagttc tggatgaaca tggacagttg	2340
gccgatgatg tcgctcagcg cggaaggtta ttaccaggg gactccctga aaaaggtcat	2400
ctcagcgttg tatggggacc agataataaa gacagatgtt catttgtata tcatgttgca	2460
cacaataaag atgatatgca atctcagctc gttcctgttc tgtgtataca gcacccta	2520
caggaaaaaa ca	2532

<210> 124  
 <211> 831  
 <212> DNA  
 <213> Escherichia coli  
 <400> 124

atggtataaat gtcatactct gattaaccgt agaaataaat gtctgctgat tgtttttata	60
gtccttattg gatggattat attcagacct aaagcatata cttattcact aaatgataaa	120
gaaaaagaga tgctcataat gttatcaca catcctgaaa ctcggtactt tggattttat	180
tccatagaac ttccggctga ttacaaacca acaggaatgg ttatgttcac acaaggatcg	240
gcatgatgcc ctgtagaaac aaagctacaa tattatcctc cttttctgca atatatgaca	300
cgatatgagg cagaactaaa aaacacctca gcattagatc cactggatac gccttatttg	360
aagcaagttc acccactaag tccacctatg aatggagatc tttttgaacg aatgaaagcg	420
aaatacacc cagattttgc acgagtattg gatgcatgga aatgggaaaa tggcgttacg	480
ttttcagtaa aaatagaagc taaagatggg agagcaaccc gctatgatgg aattagtaag	540
attgccgaat acagttatgg atataatatt ccagaaaaaa aagtacagtt acttactatt	600
ctttcaggac tacaacctcg tgcagataac caacccccat cagaaaaata attggcgata	660
caatatgcac aggttgacgc ttcactactt ggagagtatg aattatctgt agattataaa	720
aatagcaata atattaaaat aagtttgacg acggataata atagttatat tgactcatta	780
ttagatataa gatatccgag taatggaaac agagcatggg ataactctat a	831

<210> 125  
 <211> 1098  
 <212> DNA  
 <213> Escherichia coli

<400> 125	
atgctacctg agcctgttta tgcagcctgg attatattat taatatctat gttaacagtt	60
ggctactctgt tttttttatc ggtctggaat tctgcgacat actgggatat tttttttat	120
ggcgttctgc caatgctgtt tctttggcta tgtttgtttg gtattgcgct gaacaaatat	180
gaacaatccg ttgcagcctg tataagttgg gagtctgaaa gacaacaagt taaacaactc	240
tggcaacact ggagccaaaa acaactggca atagttggga atgttctttt tacaccggaa	300
gaaaaaggca tgagtgtttt actggggcca caggaagaga tccctgcata tcctaaaaag	360
gcacgacctg tattctctgc atcccgttat tctctttcgt ctatattcca tgatattcac	420
cagcaactga cacaacaatt tcctgattat cgtcattatc tacatactat ctacgtatta	480
cagcctgaga aatggcgtgg agaaccgtg agacaggcta ttttccatca atgggactta	540
gtacctgaac ggaccaatac tcttaataca atccagtctc tttatgatga aagatttgac	600
ggtctaattc tggttgtttg tttacaaaac tggccggaga ataaacctga agatacgagt	660

gaactggtat cagcacagct tatctcctca tcgtcatttg tacggcgagca ccagataccc	720
gttattgctg gtctggggcg tgtaatgcca ttagaaccgg aggagttgga gcataatctg	780
gatgtgttat ttgaatataa ccaattggat aacaaacaac tacagcatgt ctgggtctct	840
ggtttagatg agggaaacgat agaaaacctt atgcagtatg ctgaacaaca tcaatggtea	900
cttctaataa aacggccctt acacatgatt gatcattcct ttggccctac aggagagttt	960
atttttctcg tctctctggc aatgctgtca gaggctgcca aagaaactga acaaaatcat	1020
ttaattatct atcagtcagc acagtatgct cagaaaaaga gcctttgcct gattacccgg	1080
aagctttatt taaggaca	1098

<210> 126  
 <211> 780  
 <212> DNA  
 <213> Escherichia coli

<400> 126	
atgttgaaca gaaaactaaa tatacggcta cgtcattccc tgaacagcta ctgcatacct	60
tccatcatta tcaataaacac cgtacgttca ttccagaggt cagtcatgaa taccagagct	120
ctttttcccc tgctgtttac tgtggcatca ttctccgctt ccgccggcaa ctgggctgtc	180
aaaaacggct ggtgtcagac catgacggaa gatggtcagg cgctggtaat gctgaaaaat	240
ggcacgattg gtattaccgg cctgatgcag ggatgcccgaa atgggtgtaca gacgtcctcg	300
ggcagccgta tcagtatata cggtaacctg atccccacat cacaaatgtg taatcagcag	360
acgggattca gggctgttga ggtggaatc ggacaggcgc cggaaatggt caaaaaagcc	420
gttactcca tagcagagcg tgatgtgtcc gttttacagg catttggtgt acgaatggaa	480
ttcaccgcg gtgatatgct gaaggtctgt ccgaaatttg tcacatcact tgcgggtttt	540
tccccgaac agacgaccac tattaataaa gattccgtcc tgcaggctgc ccggcaggca	600
tacgccgggg aatatgacga ggaacaaca gaaaccgctg attttggctc ttacgaagta	660
aaaggcaata aggttgagtt tgaagtattc aatcctgaag accgtgcgta cgacaagtgt	720
accgtcacgg ttggtgctga cggtaatgcc accggcgcca gcgttgaatt tatcgaaaaa	780

<210> 127  
 <211> 1155  
 <212> DNA  
 <213> Escherichia coli



<400> 127

gtggaatca tcaatagcac gatactgagc ggcgaggcgc ctatcccttc cctgacgtcg	60
ctcttaccgc acatcagaaa aatgctgctg gtcactgacc gtaatatgtc gcagctcgac	120
gggtgtgcgc agattcgcgc cttactggaa aagcactgcc cgcaggttaa cgttatcgat	180
aatgtgcccg cagagcccac gcatcatgat gtgcgccagc taatggatgc cctggcgat	240
gcctcttttg atgtggtggt cgggacggc ggtggcagcg tgttgatgt ggcaagctg	300
ctatcgtgtc ttgtccatcc acaatcacgc gggctggatg cgctgcttgc gggtaaaaa	360
ccgactcagc ggggtgaatc atggttgatt cctacaaccg ccggaaccgg ctcaagaacc	420
acgccgaatg cgattctggc aatccctgag caaagcacga aggtgggtat tatttccag	480
gtgctgttac cagactatgt ggcgcttttc ccggaactga ccaccagcat gccgcgcgat	540
attgcgcgct ccacgggcat tgatgctctt tgccacttac tggagtgttt taccgcgacc	600
gtggcaaatc cggtcagcga taacgcggcg ctgactgggt taagtaaaact ttccggcac	660
attcaaccgc ccgtgaacga tctcaggat ctgcgcgcaa aactggaaat gctgtggcg	720
tcttactatg cggcgctagc gataacccat gcgggcacgc atctcgttca tgcgctctcc	780
tacccgtagt gtggcaata tcatctgccc catggcgtcg cgaatgccat cttgtgtggc	840
ccgtgcatgg cgtttgttgc ccctggggcg gtcgagaaat ttgccgggtg ctgggattgc	900
attcccgatg cggaaccgcg cctgagcgcg gaagaaaaat ctcatgccct ggtgacctgg	960
ttacaggcat tagtcaatca actcaagcta cccaacaatc tcgcggctct cggcgtagcg	1020
ccagaggata ttgcctctct gagcagggcg gactgaacg tgaagcgctt tatgaacaat	1080
gtgccgtgcc aaattgatct acaggacgta caggccattt accaaacact gtttccgcaa	1140
catccattta aggag	1155

<210> 128

<211> 315

<212> DNA

<213> *Escherichia coli*

<400> 128

atgaatatca gaaaactgtt ttgtccggga aacaccccc ggattttatt gttttatttc	60
ttttttgttg ttttgcgaat aaccacaatt gcatgcggat acactgagaa gaatgcaaca	120
ggaaatgtgc tgcttctgtt tctccttctg ctctctgcac acagaaatcc cctcacatcc	180
attacagcgc tgttatttct gttctgttgt gcaactgtatg gcctgcccgg tatgacgtac	240

ggtaaaatca acaacagttt tattgtcgcg ttgttcgaga ccacaactga tgaggcagcg 300  
gagttttaccg ggaatg 315

<210> 129  
<211> 441  
<212> DNA  
<213> Escherichia coli

<400> 129  
atgaatatc aggcacaataa agaaatggta aatttaattt gtatgttttt atttatattc 60  
tttctgtcct cggtttttgt ttcttttggg tggtatgcta tttatgaatt gtttttatgg 120  
aatgatatta ttgtatatag ctggggatat atattaattg tctttttacc ttccacatta 180  
tatgtaatgt cggtttgagat tttgtttttt gctattagtg ggcgcagatt gtctaagta 240  
acaatggtgc gccttttggtt gataaataaa attattattg ctttctctat ttgcgcagtg 300  
ttgatTTTTT cttcaattta caaaaaagaa ttattatcta gaaattatat tgctttagtg 360  
ggtatcccggt ctgggtggat gccgggtctg gcaacgaaat acgttaaaga aaaatcatta 420  
tgcgaaaaaa atggcaataa t 441

<210> 130  
<211> 534  
<212> DNA  
<213> Escherichia coli

<400> 130  
atgttttcta ttctgttttaa acgtccggcg ttgctctgta tggcgatgct gacggttgtt 60  
ctgagtggtc gggggtgat tcagaaagtg gtggatgaat cgaaaagcgt ggccctagcc 120  
gttttctaca aacaatacaa aatactgcat ctcgatttct tctcccgag cgccctgaat 180  
acggatgcgg aagatacgcc gctttccacg atggtgcatg tctggcaact gaaaaccgcg 240  
gaagattttg acaaggcgga ttacgacacc ctgtttatgc aggaagagaa gacgtggag 300  
aaggacgtac tggcaaaaca caccgtctgg gtaaaaccgg aaggcagcgg atccctgaat 360  
gtgccgttg ataaagagac gcagtttgtc gccattattg ggcagtttta tcaccctgat 420  
gaaaaaagcg acagctggcg tctggtgatc aaaaggagcg aactggagcg cgacaagccg 480  
cgctcgattg aactgatgag aagcgacctg cgactgctgc ctctcaagga taaa 534

<210> 131

<211> 627  
<212> DNA  
<213> Escherichia coli

<400> 131

atgttcttaa	aaagaaaatg	gtattacgca	gtgacgacat	ctgtcgtcat	tacttttgtt	60
gggtggaggat	attatatgta	caggcaagaa	tatcagatgg	ttgtcactgt	accaactgct	120
gacgcgaacg	atcccaactg	gccaataaaa	aggatacagt	ttgataccag	cgaatggcta	180
cagcaacttc	aatatattaa	aatagatgat	cattatatat	tgaatactca	atatactcca	240
attgctaatt	tggtgatctt	tggtattaca	ttaaaattac	agaacgcatt	aaatgggtcg	300
gataaaagac	ttctctgact	atatggcctt	gctgagatgg	atgctcagaa	atttaaagac	360
ctgatgcgcg	gtaaaaattaa	atgtgaatat	ctgaggacga	cattttgatc	ggaaacatta	420
aagcctgtca	atgattattt	ccttatttct	tttacttata	aagataagtg	gtatgaattt	480
gagacagaaa	gaaaaatato	taaaacaagt	gatgatgggt	attttttgtg	ggcatttgat	540
aatactgtcc	acgaagcagg	ctattggcat	aacacagatc	cggctgcgta	ttcctataga	600
gattaccaga	atggtaaggc	tgtgaaa				627

<210> 132  
<211> 1272  
<212> DNA  
<213> Escherichia coli

<400> 132

atggatattt	ggcggggaca	ttcgtttctg	atgacaattt	ccgctaggtt	cagacaatac	60
gttttctctc	ttatgtcaat	tttattgcag	gaacgaaaaa	tgaatatatt	cactttatcc	120
aaagcacgcg	tatactgttt	aatttcacta	tttttaccba	cgatggccat	ggctatcgat	180
ccacctgaac	gcgaactttc	gcgatttgcc	ctgaaaacga	attaccttca	gtccctgat	240
gaaggcgtct	atgaactggc	gtttgataat	gccagtaaaa	agggttttgc	agcagtcacc	300
gatcgtgtaa	atcgtgaagc	caataaaggc	tatctgtatt	cgtttaattc	agattcgcgtg	360
aaagtcgaaa	ataaatacac	gatgccatgc	cgggcatttt	cgctggcgat	aaatcaggat	420
aaacatcagc	tctatatcgg	acacaccagg	tcagcgtccc	tgcgtatcag	tatgtttgac	480
accccaaccg	gcaaaactgt	aagaaccagg	gacaggttaa	gttttaaaag	ggcaaacgct	540
gcagattcgc	gttttgagca	ttttcgccat	atggtttaca	gccaggattc	cgataccctg	600
tttgtgagtt	atagcaatat	gctgaaaacg	gccgagggca	tgaagcctct	gcataagctg	660

ttaatgctcg acgggacgac gcttgcctta aaaggcgagg ttaaggatgc ttacaaagg	720
acagcgtatg gtctgacgat ggatgaaaaa acacagaaaa tctacgttgg cggaagagat	780
tacatcaacg aaattgatgc gaaaaatcag acgctgctgc gtacccatccc gttgaaagat	840
ccgagaccac aaatcacaag tgtgcagaat ctggcggtgg actccgcttc tgaccgtgcc	900
tttgtggtgg tattcgacca tgacgatcgt tccggtacaa aagatggact ctatatTTTT	960
gacttacgcg acggtaaaca gcttggctat gtgcacacag gagccggagc taacgcggtg	1020
aaatacaatc cgaaatataa cgaactgtat gtcaccaact tcactagcgg caccatcagc	1080
gtagtggatg ccaccaaata cagcatcacc cgtgaattta acatgccggg ctacccaac	1140
cagatggtgt tgtcggacga tatggatacc ctttacattg gcatcaaaga aggcTTtaac	1200
cgcgattggg atcctgatgt gtttggtaa ggagctaaag aacgtattct gagcattgat	1260
ttgaaaaagt cg	1272

<210> 133  
 <211> 163  
 <212> PRT  
 <213> *Escherichia coli*

<400> 133

Met	Ala	Ile	Pro	Ala	Tyr	Leu	Trp	Leu	Lys	Asp	Asp	Gly	Gly	Ala	Asp
1				5					10					15	

Ile	Lys	Gly	Ser	Val	Asp	Val	Gln	Gly	Arg	Glu	Gly	Ser	Ile	Glu	Val
			20					25					30		

Val	Ala	Leu	Asp	His	Asp	Val	Tyr	Ile	Pro	Thr	Asp	Asn	Asn	Thr	Gly
		35					40					45			

Lys	Leu	Thr	Gly	Thr	Arg	Thr	His	Lys	Pro	Phe	Thr	Phe	Thr	Lys	Glu
	50					55					60				

Ile	Asp	Ala	Ser	Ser	Pro	Tyr	Leu	Tyr	Lys	Ala	Val	Thr	Thr	Gly	Gln
65					70				75					80	

Thr	Leu	Lys	Thr	Ala	Glu	Phe	Lys	Phe	Tyr	Arg	Ile	Asn	Asp	Ala	Gly
			85						90					95	

Gln	Glu	Val	Glu	Tyr	Phe	Asn	Ile	Thr	Leu	Asp	Asn	Val	Lys	Leu	Val
		100						105					110		

Arg Val Ala Pro Leu Met His Asp Ile Lys Asp Pro Ser Arg Glu Lys  
115 120 125

His Asn His Leu Glu Arg Ile Glu Phe Arg Tyr Glu Lys Ile Thr Trp  
130 135 140

Thr Tyr Lys Asp Gly Asn Ile Ile His Ser Asp Ser Trp Asn Glu Arg  
145 150 155 160

Pro Ser Ala

<210> 134  
<211> 550  
<212> PRT  
<213> Escherichia coli

<400> 134

Val Arg Asn Thr Leu Lys Gln Ala Ile Val Leu Trp Gly Met Val Leu  
1 5 10 15

Leu Leu Val Leu Trp Ser Val Phe Ile Ser Pro Ser Gly Val Leu Arg  
20 25 30

Trp Ala Gly Ala Ala Ala Ile Val Leu Ala Val Ala Ala Leu Leu Ile  
35 40 45

Tyr Arg Arg Arg Gln Ala Trp Thr Glu Met Thr Gly Asp Ala Gly Leu  
50 55 60

Ser Ser Leu Pro Pro Glu Thr Tyr Arg Gln Pro Val Val Leu Val Cys  
65 70 75 80

Gly Gly Leu Ser Ala His Leu Ser Thr Asp Ser Pro Val Arg Gln Val  
85 90 95

Ser Glu Gly Leu Tyr Leu His Val Pro Asp Glu Glu Gln Leu Val Ala  
100 105 110

Gln Val Glu Arg Leu Leu Thr Leu Arg Pro Ala Trp Ala Ser Gln Leu  
115 120 125

Ala Val Ala Tyr Thr Ile Met Pro Gly Ile His Arg Asp Val Ala Val  
130 135 140

Leu Ala Gly Arg Leu Arg Arg Phe Ala His Ser Met Ala Thr Val Arg  
145 150 155 160

Arg Arg Ala Gly Val Asn Val Pro Trp Leu Leu Trp Ser Gly Leu Ser  
165 170 175

Gly Ser Pro Leu Pro Glu Arg Ala Ser Ser Pro Trp Phe Ile Cys Thr  
180 185 190

Gly Gly Glu Val Gln Val Ala Thr Ser Thr Glu Thr Thr Met Pro Ala  
195 200 205

Gln Trp Ile Ala Gln Ser Gly Val Gln Glu Arg Ser Gln Arg Leu Cys  
210 215 220

Tyr Leu Leu Lys Ala Glu Ser Leu Met Gln Trp Leu Asn Leu Asn Val  
225 230 235 240

Leu Thr Ala Leu Asn Gly Pro Glu Ala Lys Cys Pro Pro Leu Ala Met  
245 250 255

Thr Val Gly Leu Val Pro Ser Leu Pro Ala Val Asp Asn Asn Leu Trp  
260 265 270

Gln Leu Trp Ile Thr Ala Arg Thr Gly Leu Thr Pro Asp Ile Ala Asp  
275 280 285

Thr Gly Thr Asp Asp Ala Leu Pro Phe Pro Asp Ala Leu Leu Arg Gln  
290 295 300

Leu Pro Arg Gln Ser Gly Phe Thr Pro Leu Arg Arg Ala Cys Val Thr  
305 310 315 320

Met Leu Gly Val Thr Thr Val Ala Gly Ile Ala Ala Leu Cys Leu Ser  
325 330 335

Ala Thr Ala Asn Arg Gln Leu Leu Arg Gln Val Gly Asp Asp Leu His  
340 345 350

Arg Phe Tyr Ala Val Pro Val Glu Glu Phe Ile Thr Lys Ala Arg His  
355 360 365

Leu Ser Val Leu Lys Asp Asp Ala Thr Met Leu Asp Gly Tyr Tyr Arg  
370 375 380

Glu Gly Glu Pro Leu Arg Leu Gly Leu Gly Leu Tyr Pro Gly Glu Arg  
385 390 395 400

Ile Arg Gln Pro Val Leu Arg Ala Ile Arg Asp Trp Arg Pro Pro Glu  
405 410 415

Gln Lys Met Glu Val Thr Ala Ser Leu Gln Val Gln Thr Val Arg Leu  
420 425 430

Asp Ser Met Ser Leu Phe Asp Val Gly Gln Ala Arg Leu Lys Asp Gly  
435 440 445

Ser Thr Lys Val Leu Val Asp Ala Leu Val Asn Ile Arg Ala Lys Pro  
450 455 460

Gly Trp Leu Ile Leu Val Ala Gly Tyr Thr Asp Ala Thr Gly Asp Glu  
465 470 475 480

Lys Ser Asn Gln Gln Leu Ser Leu Arg Arg Ala Glu Ala Val Arg Asn  
485 490 495

Trp Met Leu Gln Thr Ser Asp Ile Pro Ala Thr Cys Phe Ala Val Gln  
500 505 510

Gly Leu Gly Glu Ser Gln Pro Ala Ala Thr Asn Asp Thr Pro Gln Gly  
515 520 525

Arg Ala Val Asn Arg Arg Val Glu Ile Ser Leu Val Pro Arg Ser Asp  
530 535 540

Ala Cys Gln Asp Val Lys  
545 550

<210> 135

<211> 194

<212> PRT

<213> Escherichia coli

<400> 135

Met Ile Lys Ser Thr Phe Trp Arg Ala Leu Ala Leu Thr Ala Thr Leu  
1 5 10 15

Ile Leu Thr Gly Cys Ser His Ser Gln Pro Glu Gln Glu Gly Arg Pro  
20 25 30

Gln Ala Trp Leu Gln Pro Gly Thr Leu Ile Thr Leu Pro Ala Pro Gly  
35 40 45

Ile Ser Pro Ala Val Asn Ser Gln Gln Leu Leu Thr Gly Ser Phe Asn  
50 55 60

Gly Lys Thr Gln Ser Leu Leu Val Met Leu Asn Ala Glu Asp Gln Lys  
65 70 75 80

Ile Thr Leu Ala Gly Leu Ser Ser Val Gly Ile Arg Leu Phe Leu Val  
85 90 95

Thr Tyr Asp Ala Lys Gly Leu Arg Ala Glu Gln Ser Ile Val Val Pro  
100 105 110

Gln Leu Pro Pro Ala Ser Gln Val Leu Ala Asp Val Met Leu Ser His  
115 120 125

Trp Pro Ile Ser Ala Trp Gln Pro Gln Leu Pro Thr Gly Trp Thr Leu  
130 135 140

Arg Asp Asn Gly Asp Lys Arg Glu Leu Arg Asn Ala Ser Gly Lys Leu  
145 150 155 160

Val Thr Glu Ile Thr Tyr Leu Asn Arg Gln Gly Lys Arg Val Pro Ile  
165 170 175

Ser Ile Glu Gln His Val Phe Lys Tyr His Ile Thr Ile Gln Tyr Leu  
180 185 190

Gly Asp

<210> 136

<211> 129



<212> PRT  
<213> Escherichia coli

<400> 136

Met Lys Arg Tyr Ile Lys Trp Phe Ala Ile Thr Ile Phe Ile Ser Met  
1 5 10 15

Leu Ser Ala Cys Val Arg Thr Ala Pro Val Gln Gln Ile Ser Thr Thr  
20 25 30

Val Ser Val Gly His Thr Gln Glu Gln Val Lys Asn Ala Ile Leu Lys  
35 40 45

Ala Gly Ala Gln Arg Lys Trp Ile Met Thr Gln Val Ser Pro Gly Val  
50 55 60

Ile Lys Ala Arg Tyr Gln Thr Arg Asn His Val Ala Glu Val Arg Ile  
65 70 75 80

Thr Tyr Thr Ala Thr Tyr Tyr Asn Ile Lys Tyr Asp Ser Ser Leu Asn  
85 90 95

Leu Gln Ala Ser Asp Gly Lys Ile His Lys Asn Tyr Asn Arg Trp Val  
100 105 110

Arg Asn Leu Asp Lys Asp Ile Gln Val Asn Leu Ser Thr Gly Ala Thr  
115 120 125

Leu

<210> 137  
<211> 415  
<212> PRT  
<213> Escherichia coli

<400> 137

Met Lys Arg Lys His Leu Leu Leu Leu Leu Leu Phe Ser Phe Ser Thr  
1 5 10 15

Asn Ser Ala Pro Leu Tyr Ser Leu Ile Arg Glu Ala Val Met His Asp  
20 25 30

Pro Ile Val Met Glu Ala Arg Ala Glu Leu Thr Ser Ala Gln Ser Arg  
35 40 45

Ile Glu Gln Ala Ser Ser Ala His Trp Pro Val Val Thr Ala Thr Gly  
50 55 60

Ser Lys Leu Leu Ser Gln Ser His Arg Tyr Ser Tyr Asp Tyr Asp Thr  
65 70 75 80

Glu Asp Ile Leu Pro Gly Ile Arg Gly Glu Val Asn Ile Phe Ala Ser  
85 90 95

Gly Ala Ile Glu Ala Asp Val Arg Arg Ser Glu Ser Glu Ala Glu Tyr  
100 105 110

Tyr His Tyr Lys Met Glu Glu Thr Lys Glu Glu Thr Ile His Ser Phe  
115 120 125

Val Ser Leu Tyr Leu Asp Ala Leu Arg Glu Lys Gln Ser Ile Ala Val  
130 135 140

Leu Glu Gln Ser Leu Ser Arg His Asn Ala Ile Leu Asn Asp Leu Asn  
145 150 155 160

Thr Ile Ser Ile His Asp Thr Gly Arg Glu Ser Glu Leu Val Gln Ala  
165 170 175

Glu Ala Arg Arg Leu Met Val Arg Gln Gln Ile Asn Ser Arg Ser Arg  
180 185 190

Val Leu Lys Thr Thr Leu Gly Lys Leu Ser Thr Trp Thr Lys Asn Pro  
195 200 205

Val Thr Glu Ala Asp Leu Glu Asn Pro Phe Ser Arg Met Thr Glu Ala  
210 215 220

Lys Leu Leu Thr Asp Phe Thr Gln Ala Pro Gln Lys Gly Asn Pro Ser  
225 230 235 240

Trp Leu Ala Ser Gln Ala Asp Val Glu Ser Lys Lys Ala Ala Leu Lys  
245 250 255

Ala Gln Glu Leu Ala Arg Tyr Pro Arg Val Asp Leu Thr Gly Ser Val

260

265

270

Thr Arg Asp Asp Gln Gln Ile Gly Val Asn Leu Ser Trp Asp Leu Phe  
 275 280 285

Asn Arg Asn Ala Ser Tyr Gly Val Thr Glu Lys Ala Ala Gln Ile Val  
 290 295 300

Ala Ala Thr Gly Arg Leu Asp Ser Val Ala Arg Met Ile Asp Glu Thr  
 305 310 315 320

Gly Arg Leu Ser Leu Ile Thr Val Arg Gln Ser Arg Gly Glu Met Glu  
 325 330 335

Thr Leu Arg Arg Gln Glu Gln Ala Ser Ala Arg Val Val Asp Phe Tyr  
 340 345 350

Arg Leu Gln Phe Gln Val Ala Arg Lys Thr Leu Ile Glu Leu Leu Asn  
 355 360 365

Ala Glu Asn Glu Leu Tyr Ser Val Gly Leu Ser Arg Val Gln Thr Glu  
 370 375 380

Asp Gln Met Leu His Gly Met Leu Asp Tyr Leu Tyr Ser Gln Gly Met  
 385 390 395 400

Leu Leu Lys Trp Ser Gly Val Asn Leu Ser Gly Glu Glu Glu Lys  
 405 410 415

<210> 138

<211> 201

<212> PRT

<213> Escherichia coli

<400> 138

Met Lys Phe Leu Pro Leu Leu Ala Leu Leu Ile Ser Pro Phe Val Ser  
 1 5 10 15

Ala Leu Thr Leu Asp Asp Leu Gln Gln Arg Phe Thr Glu Gln Pro Val  
 20 25 30

Ile Arg Ala His Phe Asp Gln Thr Arg Thr Ile Lys Asp Leu Pro Gln  
 35 40 45

Pro Leu Arg Ser Gln Gly Gln Met Leu Ile Ala Arg Asp Gln Gly Leu  
50 55 60

Leu Trp Asp Gln Thr Ser Pro Phe Pro Met Gln Leu Leu Leu Asp Asp  
65 70 75 80

Lys Arg Met Val Gln Val Ile Asn Gly Gln Pro Pro Gln Ile Ile Thr  
85 90 95

Ala Glu Asn Asn Pro Gln Met Phe Gln Phe Asn His Leu Leu Arg Ala  
100 105 110

Leu Phe Gln Ala Asp Arg Lys Val Leu Glu Gln Asn Phe Arg Val Glu  
115 120 125

Phe Ala Asp Lys Gly Glu Gly Arg Trp Thr Leu Arg Leu Thr Pro Thr  
130 135 140

Thr Thr Pro Leu Asp Lys Ile Phe Asn Thr Ile Asp Leu Ala Gly Lys  
145 150 155 160

Thr Tyr Leu Glu Ser Ile Gln Leu Asn Asp Lys Gln Gly Asp Arg Thr  
165 170 175

Asp Ile Ala Leu Thr Gln His Gln Leu Thr Pro Ala Gln Leu Thr Asp  
180 185 190

Asp Glu His Gln Arg Phe Ala Ala Gln  
195 200

<210> 139

<211> 770

<212> PRT

<213> Escherichia coli

<400> 139

Met Glu Asn Phe Phe Met Lys Asn Ser Lys Val Phe Tyr Arg Ser Ala  
1 5 10 15

Leu Ala Thr Ala Ile Val Met Ala Leu Ser Ala Pro Ala Phe Ala Thr  
20 25 30

Asp Ser Thr Val Ser Thr Asp Pro Val Thr Leu Asn Thr Glu Lys Thr  
35 40 45

Thr Leu Asp Gln Asp Val Val Ile Asn Gly Asp Asn Lys Ile Thr Ala  
50 55 60

Val Thr Ile Glu Thr Ser Asp Ser Asp Lys Asp Leu Asn Val Thr Phe  
65 70 75 80

Gly Gly His Asp Ile Thr Ala Ala Ser Thr Val Asn Gln Asp Phe Val  
85 90 95

Glu Gly Val Lys Val Ser Gly Asn Lys Asn Val Val Ile Asn Ala Thr  
100 105 110

Asp Ser Thr Ile Thr Ala Gln Gly Glu Gly Thr Tyr Val Arg Thr Ala  
115 120 125

Met Val Ile Asp Ser Thr Gly Asp Val Val Val Asn Gly Gly Asn Phe  
130 135 140

Val Ala Lys Asn Glu Lys Gly Ser Ala Thr Gly Ile Ser Leu Glu Ala  
145 150 155 160

Thr Thr Gly Asn Asn Leu Thr Leu Asn Gly Thr Thr Ile Asn Ala Gln  
165 170 175

Gly Asn Lys Ser Tyr Ser Asn Gly Ser Thr Ala Ile Phe Ala Gln Lys  
180 185 190

Gly Asn Leu Leu Gln Gly Phe Asp Gly Asp Ala Thr Asp Asn Ile Thr  
195 200 205

Leu Ala Asp Ser Asn Ile Ile Asn Gly Gly Ile Glu Thr Ile Val Thr  
210 215 220

Ala Gly Asn Lys Thr Gly Ile His Thr Val Asn Leu Asn Ile Lys Asp  
225 230 235 240

Gly Ser Val Ile Gly Ala Ala Asn Asn Lys Gln Thr Ile Tyr Ala Ser  
245 250 255

Ala Ser Ala Gln Gly Ala Gly Ser Ala Thr Gln Asn Leu Asn Leu Ser  
260 265 270

Val Ala Asp Ser Thr Ile Tyr Ser Asp Val Leu Ala Leu Ser Glu Ser  
275 280 285

Glu Asn Ser Ala Ser Thr Thr Thr Asn Val Asn Met Asn Val Ala Arg  
290 295 300

Ser Tyr Trp Glu Gly Asn Ala Tyr Thr Phe Asn Ser Gly Asp Lys Ala  
305 310 315 320

Gly Ser Asp Leu Asp Ile Asn Leu Ser Asp Ser Ser Val Trp Lys Gly  
325 330 335

Lys Val Ser Gly Ala Gly Asp Ala Ser Val Ser Leu Gln Asn Gly Ser  
340 345 350

Val Trp Asn Val Thr Gly Ser Ser Thr Val Asp Ala Leu Ala Val Lys  
355 360 365

Asp Ser Thr Val Asn Ile Thr Lys Ala Thr Val Asn Thr Gly Thr Phe  
370 375 380

Ala Ser Gln Asn Gly Thr Leu Ile Val Asp Ala Ser Ser Glu Asn Thr  
385 390 395 400

Leu Asp Ile Ser Gly Lys Ala Ser Gly Asp Leu Arg Val Tyr Ser Ala  
405 410 415

Gly Ser Leu Asp Leu Ile Asn Glu Gln Thr Ala Phe Ile Ser Thr Gly  
420 425 430

Lys Asp Ser Thr Leu Lys Ala Thr Gly Thr Thr Glu Gly Gly Leu Tyr  
435 440 445

Gln Tyr Asp Leu Thr Gln Gly Ala Asp Gly Asn Phe Tyr Phe Val Lys  
450 455 460

Asn Thr His Lys Ala Ser Asn Ala Ser Ser Val Ile Gln Ala Met Ala  
465 470 475 480

Ala Ala Pro Ala Asn Val Ala Asn Leu Gln Ala Asp Thr Leu Ser Ala

485

490

495

Arg Gln Asp Ala Val Arg Leu Ser Glu Asn Asp Lys Gly Gly Val Trp  
500 505 510

Ile Gln Tyr Phe Gly Gly Lys Gln Lys His Thr Thr Ala Gly Asn Ala

515

520

525

Ser Tyr Asp Leu Asp Val Asn Gly Val Met Leu Gly Gly Asp Thr Arg  
530 535 540

Phe Met Thr Glu Asp Gly Ser Trp Leu Ala Gly Val Ala Met Ser Ser  
545 550 555 560

Ala Lys Gly Asp Met Thr Thr Met Gln Ser Lys Gly Asp Thr Glu Gly  
565 570 575

Tyr Ser Phe His Ala Tyr Leu Ser Arg Gln Tyr Asn Asn Gly Ile Phe  
580 585 590

Ile Asp Thr Ala Ala Gln Phe Gly His Tyr Ser Asn Thr Ala Asp Val  
595 600 605

Arg Leu Met Asn Gly Gly Gly Thr Ile Lys Ala Asp Phe Asn Thr Asn  
610 615 620

Gly Phe Gly Ala Met Val Lys Gly Gly Tyr Thr Trp Lys Asp Gly Asn  
625 630 635 640

Gly Leu Phe Ile Gln Pro Tyr Ala Lys Leu Ser Ala Leu Thr Leu Glu  
645 650 655

Gly Val Asp Tyr Gln Leu Asn Gly Val Asp Val His Ser Asp Ser Tyr  
660 665 670

Asn Ser Val Leu Gly Glu Ala Gly Thr Arg Val Gly Tyr Asp Phe Ala  
675 680 685

Val Gly Asn Ala Thr Val Lys Pro Tyr Leu Asn Leu Ala Ala Leu Asn  
690 695 700

Glu Phe Ser Asp Gly Asn Lys Val Arg Leu Gly Asp Glu Ser Val Asn  
705 710 715 720

Ala Ser Ile Asp Gly Ala Ala Phe Arg Val Gly Ala Gly Val Gln Ala  
725 730 735

Asp Ile Thr Lys Asn Met Gly Ala Tyr Ala Ser Leu Asp Tyr Thr Lys  
740 745 750

Gly Asp Asp Ile Glu Asn Pro Leu Gln Gly Val Val Gly Ile Asn Val  
755 760 765

Thr Trp  
770

<210> 140  
<211> 660  
<212> PRT  
<213> Escherichia coli

<400> 140

Met Ser Arg Pro Gln Phe Thr Ser Leu Arg Leu Ser Leu Leu Ala Leu  
1 5 10 15

Ala Val Ser Ala Thr Leu Pro Thr Phe Ala Phe Ala Thr Glu Thr Met  
20 25 30

Thr Val Thr Ala Thr Gly Asn Ala Arg Ser Ser Phe Glu Ala Pro Met  
35 40 45

Met Val Ser Val Ile Asp Thr Ser Ala Pro Glu Asn Gln Thr Ala Thr  
50 55 60

Ser Ala Thr Asp Leu Leu Arg His Val Pro Gly Ile Thr Leu Asp Gly  
65 70 75 80

Thr Gly Arg Thr Asn Gly Gln Asp Val Asn Met Arg Gly Tyr Asp His  
85 90 95

Arg Gly Val Leu Val Leu Val Asp Gly Val Arg Gln Gly Thr Asp Thr  
100 105 110

Gly His Leu Asn Gly Thr Phe Leu Asp Pro Ala Leu Ile Lys Arg Val  
115 120 125



Glu Ile Val Arg Gly Pro Ser Ala Leu Leu Tyr Gly Ser Gly Ala Leu  
130 135 140

Gly Gly Val Ile Ser Tyr Asp Thr Val Asp Ala Lys Asp Leu Leu Gln  
145 150 155 160

Glu Gly Gln Ser Ser Gly Phe Arg Val Phe Gly Thr Gly Gly Thr Gly  
165 170 175

Asp His Ser Leu Gly Leu Gly Ala Ser Ala Phe Gly Arg Thr Glu Asn  
180 185 190

Leu Asp Gly Ile Val Ala Trp Ser Ser Arg Asp Arg Gly Asp Leu Arg  
195 200 205

Gln Ser Asn Gly Glu Thr Ala Pro Asn Asp Glu Ser Ile Asn Asn Met  
210 215 220

Leu Ala Lys Gly Thr Trp Gln Ile Asp Ser Ala Gln Ser Leu Ser Gly  
225 230 235 240

Leu Val Arg Tyr Tyr Asn Asn Asp Ala Arg Glu Pro Lys Asn Pro Gln  
245 250 255

Thr Val Glu Ala Ser Asp Ser Ser Asn Pro Met Val Asp Arg Ser Thr  
260 265 270

Ile Gln Arg Asp Ala Gln Leu Ser Tyr Lys Leu Ala Pro Gln Gly Asn  
275 280 285

Asp Trp Leu Asn Ala Asp Ala Lys Ile Tyr Trp Ser Glu Val Arg Ile  
290 295 300

Asn Ala Gln Asn Thr Gly Ser Ser Gly Glu Tyr Arg Glu Gln Ile Thr  
305 310 315 320

Lys Gly Ala Arg Leu Glu Asn Arg Ser Thr Leu Phe Ala Asp Ser Phe  
325 330 335

Ala Ser His Leu Leu Thr Tyr Gly Gly Glu Tyr Tyr Arg Gln Glu Gln  
340 345 350

His Pro Gly Gly Ala Thr Thr Gly Phe Pro Gln Ala Lys Ile Asp Phe  
355 360 365

Ser Ser Gly Trp Leu Gln Asp Glu Ile Thr Leu Arg Asp Leu Pro Ile  
370 375 380

Thr Leu Leu Gly Gly Thr Arg Tyr Asp Ser Tyr Arg Gly Ser Ser Asp  
385 390 395 400

Gly Tyr Lys Asp Val Asp Ala Asp Lys Trp Ser Ser Arg Ala Gly Met  
405 410 415

Thr Ile Asn Pro Thr Asn Trp Leu Met Leu Phe Gly Ser Tyr Ala Gln  
420 425 430

Ala Phe Arg Ala Pro Thr Met Gly Glu Met Tyr Asn Asp Ser Lys His  
435 440 445

Phe Ser Ile Gly Arg Phe Tyr Thr Asn Tyr Trp Val Pro Asn Pro Asn  
450 455 460

Leu Arg Pro Glu Thr Asn Glu Thr Gln Glu Tyr Gly Phe Gly Leu Arg  
465 470 475 480

Phe Asp Asp Leu Met Leu Ser Asn Asp Ala Leu Glu Phe Lys Ala Ser  
485 490 495

Tyr Phe Asp Thr Lys Ala Lys Asp Tyr Ile Ser Thr Thr Val Asp Phe  
500 505 510

Ala Ala Ala Thr Thr Met Ser Tyr Asn Val Pro Asn Ala Lys Ile Trp  
515 520 525

Gly Trp Asp Val Met Thr Lys Tyr Thr Thr Asp Leu Phe Ser Leu Asp  
530 535 540

Val Ala Tyr Asn Arg Thr Arg Gly Lys Asp Thr Asp Thr Gly Glu Tyr  
545 550 555 560

Ile Ser Ser Ile Asn Pro Asp Thr Val Thr Ser Thr Leu Asn Ile Pro  
565 570 575

Ile Ala His Ser Gly Phe Ser Val Gly Trp Val Gly Thr Phe Ala Asp  
580 585 590

Arg Ser Thr His Ile Ser Ser Ser Tyr Ser Lys Gln Pro Gly Tyr Gly  
595 600 605

Val Asn Asp Phe Tyr Val Ser Tyr Gln Gly Gln Gln Ala Leu Lys Gly  
610 615 620

Met Thr Thr Thr Leu Val Leu Gly Asn Ala Phe Asp Lys Glu Tyr Trp  
625 630 635 640

Ser Pro Gln Gly Ile Pro Gln Asp Gly Arg Asn Gly Lys Ile Phe Val  
645 650 655

Ser Tyr Gln Trp  
660

<210> 141  
<211> 719  
<212> PRT  
<213> Escherichia coli

<400> 141

Met Arg Asp Glu Met Leu Tyr Asn Ile Pro Cys Arg Ile Tyr Ile Leu  
1 5 10 15

Ser Thr Leu Ser Leu Cys Ile Ser Gly Ile Val Ser Thr Ala Thr Ala  
20 25 30

Thr Ser Ser Glu Thr Lys Ile Ser Asn Glu Glu Thr Leu Val Val Thr  
35 40 45

Thr Asn Arg Ser Ala Ser Asn Leu Trp Glu Ser Pro Ala Thr Ile Gln  
50 55 60

Val Ile Asp Gln Gln Thr Leu Gln Asn Ser Thr Asn Ala Ser Ile Ala  
65 70 75 80

Asp Asn Leu Gln Asp Ile Pro Gly Val Glu Ile Thr Asp Asn Ser Leu  
85 90 95

Ala Gly Arg Lys Gln Ile Arg Ile Arg Gly Glu Ala Ser Ser Arg Val

100

105

110

Leu Ile Leu Ile Asp Gly Gln Glu Val Thr Tyr Gln Arg Ala Gly Asp  
 115 120 125

Asn Tyr Gly Val Gly Leu Leu Ile Asp Glu Ser Ala Leu Glu Arg Val  
 130 135 140

Glu Val Val Lys Gly Pro Tyr Ser Val Leu Tyr Gly Ser Gln Ala Ile  
 145 150 155 160

Gly Gly Ile Val Asn Phe Ile Thr Lys Lys Gly Gly Asp Lys Leu Ala  
 165 170 175

Ser Gly Val Val Lys Ala Val Tyr Asn Ser Ala Thr Ala Gly Trp Glu  
 180 185 190

Glu Ser Ile Ala Val Gln Gly Ser Ile Gly Gly Phe Asp Tyr Arg Ile  
 195 200 205

Asn Gly Ser Tyr Ser Asp Gln Gly Asn Arg Asp Thr Pro Asp Gly Arg  
 210 215 220

Leu Pro Asn Thr Asn Tyr Arg Asn Asn Ser Gln Gly Val Trp Leu Gly  
 225 230 235 240

Tyr Asn Ser Gly Asn His Arg Phe Gly Leu Ser Leu Asp Arg Tyr Arg  
 245 250 255

Leu Ala Thr Gln Thr Tyr Tyr Glu Asp Pro Asp Gly Ser Tyr Glu Ala  
 260 265 270

Phe Ser Val Lys Ile Pro Lys Leu Glu Arg Glu Lys Val Gly Val Phe  
 275 280 285

Tyr Asp Thr Asp Val Asp Gly Asp Tyr Leu Lys Lys Ile His Phe Asp  
 290 295 300

Ala Tyr Glu Gln Thr Ile Gln Arg Gln Phe Ala Asn Glu Val Lys Thr  
 305 310 315 320

Thr Gln Pro Val Pro Ser Pro Met Ile Gln Ala Leu Thr Val His Asn  
 325 330 335

Lys Thr Asp Thr His Asp Lys Gln Tyr Thr Gln Ala Val Thr Leu Gln  
340 345 350

Ser His Phe Ser Leu Pro Ala Asn Asn Glu Leu Val Thr Gly Ala Gln  
355 360 365

Tyr Lys Gln Asp Arg Val Ser Gln Arg Ser Gly Gly Met Thr Ser Ser  
370 375 380

Lys Ser Leu Thr Gly Phe Ile Asn Lys Glu Thr Arg Thr Arg Ser Tyr  
385 390 395 400

Tyr Glu Ser Glu Gln Ser Thr Val Ser Leu Phe Ala Gln Asn Asp Trp  
405 410 415

Arg Phe Ala Asp His Trp Thr Trp Thr Met Gly Val Arg Gln Tyr Trp  
420 425 430

Leu Ser Ser Lys Leu Thr Arg Gly Asp Gly Val Ser Tyr Thr Ala Gly  
435 440 445

Ile Ile Ser Asp Thr Ser Leu Ala Arg Glu Ser Ala Ser Asp His Glu  
450 455 460

Met Val Thr Ser Thr Ser Leu Arg Tyr Ser Gly Phe Asp Asn Leu Glu  
465 470 475 480

Leu Arg Ala Ala Phe Ala Gln Gly Tyr Val Phe Pro Thr Leu Ser Gln  
485 490 495

Leu Phe Met Gln Thr Ser Ala Gly Gly Ser Val Thr Tyr Gly Asn Pro  
500 505 510

Asp Leu Lys Ala Glu His Ser Asn Asn Phe Glu Leu Gly Ala Arg Tyr  
515 520 525

Asn Gly Asn Thr Trp Leu Ile Asp Ser Ala Val Tyr Tyr Ser Glu Ala  
530 535 540

Lys Asp Tyr Ile Ala Ser Leu Ile Cys Asp Gly Ser Ile Val Cys Asn  
545 550 555 560

Gly Asn Thr Asn Ser Ser Arg Ser Ser Tyr Tyr Tyr Tyr Asp Asn Ile  
565 570 575

Asp Arg Ala Lys Thr Trp Gly Leu Glu Ile Ser Ala Glu Tyr Asn Gly  
580 585 590

Trp Val Phe Ser Pro Tyr Ile Ser Gly Asn Leu Ile Arg Arg Gln Tyr  
595 600 605

Glu Thr Ser Thr Leu Lys Thr Thr Asn Thr Gly Glu Pro Ala Ile Asn  
610 615 620

Gly Arg Ile Gly Leu Lys His Thr Leu Val Met Gly Gln Ala Asn Ile  
625 630 635 640

Ile Ser Asp Val Phe Ile Arg Ala Ala Ser Ser Ala Lys Asp Asp Ser  
645 650 655

Asn Gly Thr Glu Thr Asn Val Pro Gly Trp Ala Thr Leu Asn Phe Ala  
660 665 670

Val Asn Thr Glu Phe Gly Asn Glu Asp Gln Ser Arg Ile Asn Leu Ala  
675 680 685

Leu Asn Asn Leu Thr Asp Lys Arg Tyr Arg Thr Ala His Glu Thr Ile  
690 695 700

Pro Ala Ala Gly Phe Asn Ala Ala Ile Gly Phe Val Trp Asn Phe  
705 710 715

<210> 142  
<211> 199  
<212> PRT  
<213> Escherichia coli

<400> 142

Met Arg Lys Val Cys Ala Val Ile Leu Ser Ala Ala Ile Cys Leu Ser  
1 5 10 15

Val Ser Gly Ala Pro Ala Trp Ala Ser Glu His Gln Ser Thr Leu Ser  
20 25 30

Ala Gly Tyr Leu His Ala Arg Thr Asn Ala Pro Gly Ser Asp Asn Leu  
35 40 45

Asn Gly Ile Asn Val Lys Tyr Arg Tyr Glu Phe Thr Asp Ala Leu Gly  
50 55 60

Leu Ile Thr Ser Phe Ser Tyr Ala Asn Ala Glu Asp Glu Gln Lys Thr  
65 70 75 80

His Tyr Ser Asp Thr Arg Trp His Glu Asp Ser Val Arg Asn Arg Trp  
85 90 95

Phe Ser Val Met Ala Gly Pro Ser Val Arg Val Asn Glu Trp Phe Ser  
100 105 110

Ala Tyr Ser Met Ala Gly Val Ala Tyr Ser Arg Val Ser Thr Phe Ser  
115 120 125

Gly Asp Tyr Leu Arg Val Thr Asp Asn Lys Gly Lys Thr His Asp Val  
130 135 140

Leu Thr Gly Ser Asp Asp Gly Arg His Ser Asn Thr Ser Leu Ala Trp  
145 150 155 160

Gly Ala Gly Val Gln Phe Asn Pro Thr Glu Ser Val Thr Ile Asp Leu  
165 170 175

Ala Tyr Glu Gly Ser Gly Ser Gly Asp Trp Arg Thr Asp Ala Phe Ile  
180 185 190

Val Gly Ile Gly Tyr Arg Phe  
195

<210> 143

<211> 456

<212> PRT

<213> Escherichia coli

<400> 143

Met Lys Lys Ser Thr Leu Ser Leu Ala Ile Gly Leu Leu Leu Ala Cys  
1 5 10 15

Ser Thr Gly Met Ala Lys Thr Gln His Leu Thr Leu Glu Gln Arg Leu

20

25

30

Glu Ala Ala Glu Met Arg Ala Ala Lys Ala Glu Gly Gln Val Lys Gln  
 35 40 45

Leu Gln Thr Gln Gln Ala Ala Glu Ile Arg Glu Ile Lys Thr Ala Gln  
 50 55 60

Gly Asn Thr Pro Val Asn Gly Gln Ser Thr Thr Glu Ser Glu Lys Lys  
 65 70 75 80

Asn Ala Thr Pro Pro Asn Leu Leu Leu Ser Gly Tyr Gly Asp Leu Lys  
 85 90 95

Ile Tyr Gly Asp Val Glu Phe Asn Met Asp Ala Glu Ser Asn His Gly  
 100 105 110

Leu Leu Ala Met Thr Asn Ala Asp Val Asn Ser Asp Pro Thr Asn Glu  
 115 120 125

Trp Asn Leu Asn Gly Arg Ile Leu Leu Gly Phe Asp Gly Met Arg Lys  
 130 135 140

Leu Asp Asn Gly Tyr Phe Ala Gly Phe Ser Ala Gln Pro Leu Gly Asp  
 145 150 155 160

Met His Gly Ser Val Asn Ile Asp Asp Ala Val Phe Phe Phe Gly Lys  
 165 170 175

Glu Asn Asp Trp Lys Val Lys Val Gly Arg Phe Glu Ala Tyr Asp Met  
 180 185 190

Phe Pro Leu Asn Gln Asp Thr Phe Val Glu His Ser Gly Asn Thr Ala  
 195 200 205

Asn Asp Leu Tyr Asp Asp Gly Ser Gly Tyr Ile Tyr Met Met Lys Glu  
 210 215 220

Gly Arg Gly Arg Ser Asn Ala Gly Gly Asn Phe Leu Val Ser Lys Gln  
 225 230 235 240

Leu Asp Asn Trp Tyr Phe Glu Leu Asn Thr Leu Leu Glu Asp Gly Thr  
 245 250 255



Ser Leu Tyr Asn Asp Gly Asn Tyr His Gly Arg Asp Met Glu Gln Gln  
260 265 270

Lys Asn Val Ala Tyr Leu Arg Pro Val Ile Ala Trp Ser Pro Thr Glu  
275 280 285

Glu Phe Thr Val Ser Ala Ala Met Glu Ala Asn Val Val Asn Asn Ala  
290 295 300

Tyr Gly Tyr Thr Asp Ser Lys Gly Asn Phe Val Asp Gln Ser Asp Arg  
305 310 315 320

Thr Gly Tyr Gly Met Ser Met Thr Trp Asn Gly Leu Lys Thr Asp Pro  
325 330 335

Glu Asn Gly Ile Val Val Asn Leu Asn Thr Ala Tyr Leu Asp Ala Asn  
340 345 350

Asn Glu Lys Asp Phe Thr Ala Gly Ile Asn Ala Leu Trp Lys Arg Phe  
355 360 365

Glu Leu Gly Tyr Ile Tyr Ala His Asn Lys Ile Asp Glu Phe Ser Gly  
370 375 380

Val Val Cys Asp Asn Asp Cys Trp Ile Asp Asp Glu Gly Thr Tyr Asn  
385 390 395 400

Ile His Thr Ile His Ala Ser Tyr Gln Phe Ala Asn Val Met Asp Met  
405 410 415

Glu Asn Phe Asn Ile Tyr Leu Gly Thr Tyr Tyr Ser Ile Leu Asp Ser  
420 425 430

Asp Gly Asp Lys Ile His Gly Asp Asp Ser Asp Asp Arg Tyr Gly Ala  
435 440 445

Arg Val Arg Phe Lys Tyr Phe Phe  
450 455

<210> 144

<211> 174

<212> PRT  
<213> Escherichia coli

<400> 144

Met Asn Gly Lys Ala Phe Leu Ala Cys Val Leu Met Ser Val Val Leu  
1 5 10 15

Thr Gly Cys Glu Thr Ala Lys Lys Ile Ser Gln Val Ile Arg Asn Pro  
20 25 30

Asp Ile Gln Val Gly Lys Leu Met Asp Gln Ser Thr Glu Leu Thr Val  
35 40 45

Thr Leu Leu Thr Glu Pro Asp Ser Asn Leu Thr Ala Asp Gly Glu Ala  
50 55 60

Ala Pro Val Asp Val Gln Leu Val Tyr Leu Ser Asp Asp Ser Lys Phe  
65 70 75 80

His Ala Ala Asp Tyr Asp Gln Val Ala Thr Thr Ala Leu Pro Asp Val  
85 90 95

Leu Gly Lys Asn Tyr Ile Asp His Gln Asp Phe Asn Leu Leu Pro Asp  
100 105 110

Thr Val Lys Thr Leu Pro Pro Ile Lys Leu Asp Glu Lys Thr Gly Tyr  
115 120 125

Ile Gly Val Ile Ala Tyr Phe Ser Asp Asp Gln Ala Thr Glu Trp Lys  
130 135 140

Gln Ile Glu Ser Val Glu Ser Ile Gly His His Tyr Arg Leu Leu Val  
145 150 155 160

His Ile Arg Ala Ser Ala Ile Glu Met Lys Lys Glu Glu Asn  
165 170

<210> 145  
<211> 1144  
<212> PRT  
<213> Escherichia coli

<400> 145

Leu Thr Leu Ala Trp Ile Phe Leu Leu Val Trp Ile Trp Trp Gln Gly  
1 5 10 15

Pro Lys Trp Thr Leu Tyr Glu Gln His Trp Leu Ala Pro Leu Ala Asn  
20 25 30

Arg Trp Leu Ala Thr Ala Val Trp Gly Leu Ile Ala Leu Val Trp Leu  
35 40 45

Thr Trp Arg Val Met Lys Arg Leu Gln Lys Leu Glu Lys Gln Gln Lys  
50 55 60

Gln Gln Arg Glu Glu Glu Lys Asp Pro Leu Thr Val Glu Leu His Arg  
65 70 75 80

Gln Gln Gln Tyr Leu Asp His Trp Leu Leu Arg Leu Arg Arg His Leu  
85 90 95

Asp Asn Arg Arg Tyr Leu Trp Gln Leu Pro Trp Tyr Met Val Ile Gly  
100 105 110

Pro Ala Gly Ser Gly Lys Ser Thr Leu Leu Arg Glu Gly Phe Pro Ser  
115 120 125

Asp Ile Val Tyr Thr Pro Glu Ser Ile Arg Gly Val Glu Tyr His Pro  
130 135 140

Leu Ile Thr Pro Arg Val Gly Asn Gln Ala Val Ile Phe Asp Val Asp  
145 150 155 160

Gly Val Leu Thr Thr Pro Gly Gly Asp Asp Leu Leu Arg Arg Arg Leu  
165 170 175

Arg Glu His Trp Leu Gly Trp Leu Met Gln Thr Arg Ala Arg Gln Pro  
180 185 190

Leu Asn Gly Leu Ile Leu Thr Leu Asp Leu Pro Asp Leu Leu Thr Ala  
195 200 205

Asp Lys Ser Arg Arg Glu Thr Leu Val Gln Asn Leu Arg Gln Gln Leu  
210 215 220

Gln Glu Ile Arg Gln Ser Leu His Cys Arg Leu Pro Val Tyr Val Val

225		230		235		240
Leu Thr Arg	Leu Asp 245	Leu Leu Asn Gly	Phe Ala	Ala Leu	Phe His Ser 255	
Leu Asp Lys	Lys Asp 260	Arg Asp Ala Ile	Leu Gly	Val Thr	Phe Thr Arg 270	
Arg Ala His	Glu Ser 275	Asp Gly Trp Arg	Ser Glu	Leu Gly	Ala Phe Trp 285	
Gln Thr Trp	Val Gln	Gln Val Asn Leu	Ala Leu	Ser Asp	Leu Val Leu 300	
Ala Gln Thr	Gly Ala	Ala Pro Arg Ser	Ala Val	Phe Ser	Phe Ser Arg 320	
Gln Met Gln	Gly Thr 325	Gly Glu Ile Val	Thr Ala	Leu Leu	Ala Ala Leu 335	
Leu Asp Gly	Glu Asn 340	Met Asp Val Met	Leu Arg	Gly Val	Trp Leu Thr 350	
Ser Ser Leu	Gln Arg	Gly Gln Val Asp	Asp Ile	Phe Thr	Gln Ser Ala 365	
Ala Arg Gln	Tyr Gly	Leu Gly Asn Ser	Ser Ser	Leu Ala	Thr Trp Pro Leu 380	
Val Glu Thr	Thr Pro	Tyr Phe Thr Arg	Arg Leu	Phe Pro	Glu Val Leu 400	
Leu Ala Glu	Pro Asn	Leu Ala Gly Glu	Asn Ser	Val Trp	Leu Asn Ser 415	
Ser Arg Arg	Arg Leu	Thr Ala Phe Ser	Thr Cys	Gly Ala	Ala Leu Ala 430	
Ala Leu Met	Val Gly	Ser Trp His His	Tyr Tyr	Asn Gln	Asn Trp Gln 445	
Ser Gly Val	Asn Val	Leu Ala Gln Ala	Lys Ala	Phe Met	Asp Val Pro 460	

Pro Pro Gln Gly Thr Asp Glu Phe Gly Asn Leu Gln Leu Pro Leu Leu  
465 470 475 480

Asn Pro Val Arg Asp Ala Thr Leu Ala Tyr Gly Asp Tyr Arg Asp His  
485 490 495

Gly Phe Leu Ala Asp Met Gly Leu Tyr Gln Gly Ala Arg Val Gly Pro  
500 505 510

Tyr Val Glu Gln Thr Tyr Ile Gln Leu Leu Glu Gln Arg Tyr Leu Pro  
515 520 525

Ser Leu Met Asn Gly Leu Ile Arg Asp Leu Asn Ile Ala Pro Pro Glu  
530 535 540

Ser Glu Glu Lys Leu Ala Val Leu Arg Val Val Arg Met Met Glu Asp  
545 550 555 560

Lys Ser Gly Arg Asn Asn Glu Ala Val Lys Gln Tyr Met Ala Arg Arg  
565 570 575

Trp Ser Asn Glu Phe His Gly Gln Arg Asp Ile Gln Ala Gln Leu Met  
580 585 590

Val His Leu Asp Tyr Ala Leu Glu His Thr Asp Trp His Ala Gln Arg  
595 600 605

Gln Ser Ser Asp Ser Asp Ala Val Ser Arg Trp Thr Pro Tyr Asp Lys  
610 615 620

Pro Ile Ile Asn Ala Gln Gln Glu Leu Ser Lys Leu Pro Ile Tyr Gln  
625 630 635 640

Arg Val Tyr Gln Thr Leu Arg Thr Lys Ala Leu Ser Val Leu Pro Ala  
645 650 655

Asp Leu Asn Leu Arg Asp Gln Val Gly Pro Thr Phe Asp Asn Val Phe  
660 665 670

Val Ala Gly Asn Asp Glu Lys Leu Val Ile Pro Gln Phe Leu Thr Arg  
675 680 685

Tyr Gly Leu Gln Ser Tyr Phe Val Lys Gln Arg Glu Gly Leu Val Glu  
690 695 700

Leu Thr Ala Leu Asp Ser Trp Val Leu Asn Leu Thr Gln Ser Val Ala  
705 710 715 720

Tyr Ser Glu Ala Asp Arg Glu Glu Ile Gln Arg His Ile Thr Glu Gln  
725 730 735

Tyr Ile Ser Asp Tyr Thr Ala Thr Trp Arg Ala Gly Met Asp Asn Leu  
740 745 750

Asn Val Arg Asp Tyr Glu Ala Met Ser Ala Leu Thr Asp Ala Leu Glu  
755 760 765

Gln Ile Ile Ser Gly Asp Gln Pro Phe Gln Arg Ala Leu Thr Ala Leu  
770 775 780

Arg Asp Asn Thr His Ala Leu Thr Leu Ser Gly Lys Leu Asp Asp Lys  
785 790 795 800

Ala Arg Glu Ala Ala Ile Asn Glu Met Asp Tyr Arg Leu Leu Ser Arg  
805 810 815

Leu Gly His Glu Phe Ala Pro Glu Asn Ser Ala Leu Glu Glu Gln Lys  
820 825 830

Asp Lys Ala Ser Thr Leu Gln Ala Val Tyr Gln Gln Leu Thr Glu Leu  
835 840 845

His Arg Tyr Leu Leu Ala Ile Gln Asn Ser Pro Val Pro Gly Lys Ser  
850 855 860

Ala Leu Lys Ala Val Gln Leu Arg Leu Asp Gln Asn Ser Ser Asp Pro  
865 870 875 880

Ile Phe Ala Thr Arg Gln Met Ala Lys Thr Leu Pro Ala Pro Leu Asn  
885 890 895

Arg Trp Val Gly Lys Leu Ala Asp Gln Ala Trp His Val Val Met Val  
900 905 910

Glu Ala Val Arg Tyr Met Glu Val Asp Trp Arg Asp Asn Val Val Lys  
915 920 925

Pro Phe Asn Glu Gln Leu Ala Asp Asn Tyr Pro Phe Asn Pro Arg Ala  
930 935 940

Thr Gln Asp Ala Ser Leu Asp Ser Phe Glu Arg Phe Phe Lys Pro Asp  
945 950 955 960

Gly Ile Leu Asp Asn Phe Tyr Lys Asn Asn Leu Arg Leu Phe Leu Glu  
965 970 975

Asn Asp Leu Thr Phe Gly Asp Asp Gly Arg Val Leu Ile Arg Glu Asp  
980 985 990

Ile Arg Gln Gln Leu Asp Thr Ala Gln Lys Ile Arg Asp Ile Phe Phe  
995 1000 1005

Ser Gln Gln Asn Gly Leu Gly Ala Gln Phe Ala Val Glu Thr Val  
1010 1015 1020

Ser Leu Ser Gly Asn Lys Arg Arg Ser Val Leu Asn Leu Asp Gly  
1025 1030 1035

Gln Leu Val Asp Tyr Ser Gln Gly Arg Asn Tyr Thr Ala His Leu  
1040 1045 1050

Val Trp Pro Asn Asn Met Arg Glu Gly Asn Glu Ser Lys Leu Thr  
1055 1060 1065

Leu Ile Gly Thr Ser Gly Arg Ala Pro Arg Ser Ile Ala Phe Ser  
1070 1075 1080

Gly Pro Trp Ala Gln Phe Arg Leu Phe Gly Ala Gly Gln Leu Thr  
1085 1090 1095

Asn Val Thr Ser Asp Thr Phe Asn Val Arg Phe Asn Val Asp Gly  
1100 1105 1110

Gly Ala Met Val Tyr Gln Val His Val Asp Thr Glu Asp Asn Pro  
1115 1120 1125

Phe Thr Gly Gly Leu Phe Ser Leu Phe Arg Leu Pro Asp Thr Leu

1130

1135

1140

Tyr

&lt;210&gt; 146

&lt;211&gt; 489

&lt;212&gt; DNA

<213> *Escherichia coli*

&lt;400&gt; 146

```

atggctattc ctgcttatct ctggctgaaa gatgacggcg gcgcggatat caaagggttc      60
gtggacgttc aggggcgcgga aggttagcatc gaagtgggtg cgctggatca cgatgtgtac      120
atccccaccg acaataaacac cggcaaaactg accggtaacc gtactcaca gaccttttac      180
tttaccaaag aaatcgatgc gtccagcccg tatctctaca aagctgtgac caccggacag      240
acctgaaaa cggcagaatt taagttttac cgcatacaac atgccgttca ggaagtggag      300
tacttcaaca tcacgcttga taacgtcaag ctggtcagag tcgctccgct tatgcacgac      360
atcaaggatc cttccagaga gaagcataac cacctggaac gtattgagtt ccgctacgag      420
aaaatcacct ggacttacaa agacggcaac atcattcatt ccgactcgtg gaatgagcgt      480
ccttcgcc

```

&lt;210&gt; 147

&lt;211&gt; 1650

&lt;212&gt; DNA

<213> *Escherichia coli*

&lt;400&gt; 147

```

gtgaggaaca cgctgaaaca ggccatcgtg ctgtggggaa tgggtgtact gctggtgctg      60
tggtcagtgt ttatcagtcc gtctggcgtg ctgagatggg ccggtgcggc ggctatcggt      120
ctggcggttg ccgcgttgtt gatttatcgg cgcaggcagg cgtggacgga gatgaccggc      180
gatgccgggt tgatcatcgt gccgccgga acctaccgac agccggtagt gctggtctgt      240
ggcggtctgt cggcgcacct gtccactgac agcccggttc gccagggttc agaagggctg      300
tatctgcatg ttctctgatga agaacagctt ttggcgacagg tggagcgatt gctgaccctt      360
cgcccggtt gggtcatcga gcttgccgtg cgtatacca tcatgcccgg catcacccgg      420
gatgtggcgg ttctggccgg acggctgcga cggttcgccc acagtatggc gacggtgcgt      480
cgtcgggcag gcgtaaacgt cccctggctt ctctggagcg ggctgtccgg ctgcgcgttg      540

```



ccggaagag	cgagttcacc	gtggtttatc	tgtaccggcg	gcgaagtcca	ggtagcaaca	600
tccacagaga	ccaccatgcc	cgcgagtg	attgcacaat	ccggcgtaga	ggagcgagtg	660
cagcgactct	gttacctgct	gaaagctgaa	agcctgatgc	agtggctgaa	tcttaatgtg	720
ctgacggcac	tgaacggccc	ggagggcga	tgtccaccac	tggcgatgac	cgtggggctg	780
gtccctcgt	tgctcggtg	ggataacaac	ctgtggcagt	tgtggatcac	cgccagaacc	840
ggcctgacgc	cggatatcgc	ggacaccggc	acagacgatg	cgctgccatt	cccggatgcc	900
ctgttacggc	agttgccgcg	tcagtcgggc	tttaccgccg	tgcgacgagc	ctgcgtgacc	960
atgctggggc	tcaccaccgt	ggcgggtatc	gccgcgctgt	gcctgtcagc	cacggcaaat	1020
cgccagttat	tacggcaggt	cggtgacgat	ctgcaccggg	tttatgccgt	cccggtgagg	1080
gaattttatc	ccaaagcccg	tcacctgtcg	gtgctgaaag	acgatgcgac	catgctcgat	1140
gggtattacc	gggaaggaga	accctcgccg	ctcggtctgg	ggttatacc	cggcgaacgc	1200
atccgccagc	cgggtattacg	cgccattcgc	gactggcgctc	cgccctgaaca	aaaaatggag	1260
gtgacggctt	cgcttcaggt	tcagaccgtg	cgtcttgaca	gtatgtcgct	gtttgacgtc	1320
ggacaggccc	gcctgaaaga	cggctcgaca	aaagtgtctg	tggacgcaat	ggtgaacatc	1380
cgggcaaac	cggtgctgct	gatcctcgtg	gccggatata	ccgatgccac	cggcgatgaa	1440
aaaagcaatc	agcagttatc	gctgcggcgt	gccgaagcgg	tgcgcaactg	gatgtgcgag	1500
accagcgaca	tcgccggcac	ctgttttgcc	gtacaggggc	tgggcgagag	ccagcctgcg	1560
gcgaccaacg	acacgccaca	gggcccggca	gtcaaccggc	gtgtcgaaat	cagtcttggt	1620
ccgcgttctg	acgcctgtca	ggacgtgaaa				1650

<210> 148  
 <211> 582  
 <212> DNA  
 <213> Escherichia coli

<400> 148	
atgatcaaat	ccacattctg
tgtagccact	cgcaaccgga
ctcatcacgc	tgctcgccgc
ggcagcttca	acggcaaaac
atcacccttg	ccgggctgtc
	gtcggtcggc
	attgcctgtg
	tctgtgtgac
	ctacgatgca
	60
	120
	180
	240
	300

aaagggctac ggcgcgagca atccatcgtc gtcccacagt taccgcccgc aagtcaggta	360
ctggctgacg tgatgctcag ccaactggcg attagcgctt ggcaaccga acttcccaca	420
ggctggacgc ttgcgcgaca cggcgacaaa cgcgagctgc gtaacgccag cgcaaaactg	480
gtcacggaaa tcacctatct gaatcgccag ggaaaacgcg tgccaatcag cattgagcag	540
catgtcttta aataccacat caccattcaa tacttaggtg ac	582

<210> 149  
 <211> 387  
 <212> DNA  
 <213> *Escherichia coli*

<400> 149	
atgaacgtt atataaaatg gtttgcctc acaattttta tcagtatgtt gagtgcctgt	60
gtccgtacgg cccagtgca acagataagc accactgtca gtgtgggtca tactcaggag	120
caggttaaaa atgccatttt gaaagcaggt gcgcagcgca agtggattat gacgcaagtg	180
tcccttgagg ttattaaagc tcgctatcaa acacgaaatc acgttcgaga ggttcgtatt	240
acatatagc ctacctacta taacatcaaa tatgacagta gcctgaatct gcaggcttct	300
gatggaaaaa ttcataaaaa ctataaccgc tgggtgcgta acctggataa agatatacag	360
gttaacttat ctacaggagc aacgtta	387

<210> 150  
 <211> 1245  
 <212> DNA  
 <213> *Escherichia coli*

<400> 150	
atgaagcgta aacatttgtt attattattg ttgttttcat tttccactaa cagtgcgcct	60
ctttactcct taattaggga ggcagttatg cacgatccca tagtaatgga agccggggcg	120
gagttaactt cggcacaatc ccgcatagag caggcaagct ctgcacattg gccagttgtc	180
acagctacag gaagtaaact cctttcacaa agtcaccgtt attcctacga ttatgacact	240
gaagatattt taccgggtat tcgtggtgaa gtgaatatat ttgcttcagg ggctattgag	300
gcggatgtgc gtccggagtga gtcagaagcc gaatattatc attataaaat ggaagaaaca	360
aaagaggaaa caattcactc ttttgtttca ttatatcttg atgcactcag ggaaaaacaa	420
tccattgcgg tacttgaaac gagcctttcc cggcataacg caattcttaa tgacctgaat	480
accatcagta ttcattgatac cggggggggag tctgagcttg ttcaggccga agccagaagg	540

ttgatggttc ggcagcagat aaattctagg agcagagtac ttaaaaccac gctgggaaaa	600
ctgtccactt ggacaaaaaa tccggttaacc gaagctgac ttgaaatcc tttttctagg	660
atgacagagg ccaaattatt aactgat tttt acacaggctc cacagaaagg taaccgcgtc	720
tggccttcca gccaaagctga tgttgagagt aaaaaagcgg cactgaaagc acaggagctt	780
gcccggtacc ctccgggtgga tttaacgggg tctgtaacc gggatgacca gcagataggg	840
gtcaatctgt cttgggacct ctttaaccgt aatgccagt atggtgttac agaaaaagct	900
gcgcaaatag tggcagctac cggacgactg gactctgtcg ccggaatgat tgatgaaacc	960
ggcgattat ctctgataac agtcagacaa agtcgagggg aaatggaaac gtcagacgt	1020
caggaaacagg cttcagccag agttgtggac ttttatcgtc ttcagtttca ggtggcaaga	1080
aaaacactga ttgaattact gaatgctgaa aacgaactgt acagtctcgg actctcccgg	1140
gttcagacgg aggatcagat gctccacgt atgctggatt atctgtattc ccagggaatg	1200
ctcctgaaat ggagcggagt gaatctttct ggtgaagaag aaaaa	1245

<210> 151  
 <211> 603  
 <212> DNA  
 <213> *Escherichia coli*

<400> 151	
atgaaat ttt taccgctgct ggcgctgctg attagcccg ttgtgagcgc cctgaccctg	60
gacgatcttc agcaacgctt taccgaacaa ccggtgatcc gcgccattt tgatcaaacc	120
cggacgatta aagatctgcc gcagccgctg cgatctcagg gtcagatgtt gatcgccgc	180
gaccaggggt tattgtggga tcaaaccctca ccgttcccca tgcagctatt gctggatgat	240
aaacgcgatg tgcagggtgat caacgggtcag ccgccgcaaa tcatcacggc agaaaaaac	300
ccgcagatgt tccagtttaa ccacctgctg cgcgcgctgt tccaggccga tcgcaaatg	360
ctggaacaaa acttccgcgt cgaatttgct gacaaaggcg aaggccgctg gacgctgcgc	420
ctgacgccga ccaccacgcc gctggataaa attttcaaca ccatacatct cgccgggaaa	480
acctatctgg agagcattca acttaatgat aaacaggggc atcgcaccga tattgctctt	540
acccaacatc aactgacgcc agcgcaactg accgatgacg aacaccaacg ttttgcgcc	600
cag	603

<210> 152

<211> 2295  
<212> DNA  
<213> Escherichia coli

<400> 152

atgaaaaaca gtaaggattt ttaccgcagc gcattagcga cagctattgt tatggctctt	60
tctgcaccag cattcgctac tgatagcacg gtatcaactg atccggttac gctgaataca	120
gagaagacga ctctggatca agatgttggt attaacgggtg ataacaagat tacagccgta	180
acaattgaaa cgtcagattc agataaagac cttaatgtta cttttggcgg tcacgatatt	240
accgccgcat caacggtaaa ccaagatttc gttgaagggtg taaaagttag tggtaacaaa	300
aatgttgtga ttaatgctac agactccacc atcacagctc aagggtgaagt cacctatgtc	360
cggactgcaa tgggtcattga ttcaactggc gatgttggtg ttaatggcgg taatttcggt	420
gcaaaaaatg aaaaaggtag tgcgacaggg atatctctgg aagcgaccac gggaaataat	480
ttaacgctca atggtacaac cataaatgct caaggttaata agagttacag caacggctct	540
acggcaattt ttgctcaaaa gggtaatttg ttgcagggtt ttgacggtag tgcaaccgac	600
aacatcacc c ttgctgactc aaatattatt aatggcggga ttgaaacaat agttactgcc	660
gggaataaga cgggaattca tacagtcaac ctgaatatta aggatggctc agtaattggg	720
gcggctaata ataaacaac aatttatgcc tctgcttcgg cacaaggcgc aggttcagca	780
acgcaaaatt taaatttgto tgttgctgat tcaaccatct actctgatgt cctggccctt	840
tctgaaagcg agaattcagc cagtaccaca acaaatgtaa atatgaacgt tgcccgtct	900
tactgggaag gtaatgctta taccttcaat agcggcgata aagcgggtag tgatctggat	960
ataaatcttt ccgatagttc agtctggaaa ggcaaagttt caggggcagg agatgccagt	1020
gtatctctgc aaaacgggtc tgtctggaat gttacgggtt cctcaactgt tgatgctctg	1080
gcagtaaaag acagtacggt taatatcagc aaggctacag tcaatactgg cacgtttgct	1140
tctcaaaacg gcaactctgat tgttgatgcc tcttctgaaa acactctgga tatcagcgg	1200
aaagcgagcg gtgacttgcg tgtttacagt gcgggttcac tggatcttat caatgaacaa	1260
acggcattta tttctaccgg caaagacagc actctaaaag ccacaggcac aacggaaggt	1320
ggtctgtatc aatatgacct gacacaggga gctgatggta acttttattt cgtaaaaaac	1380
acgcataaag catccaacgc cagctccgtg attcaggcaa tggcagctgc tccggctaac	1440
gtcgctaata tgcaggctga cacgctctcc gcccgtcagg atgctgtccg tctgagcgaa	1500

aatgacaagg	gtggcgatg	gattcagtag	tttggcggtg	aacagaaaca	taccaccgag	1560
ggaaatgcat	cctatgacct	ggatgtaaat	gggtgaatgc	tgggtgggtg	taccgccttc	1620
atgactgaag	atggtagctg	gctggccggt	gtggcgatgt	cttctcgaa	aggtgacatg	1680
actaccatgc	agagcaaagg	tgacactgaa	ggttacagct	tccacgctta	cctgagccgc	1740
cagtataaca	acggtatctt	cattgatact	gctgcacagt	ttggtcacta	cagcaaacag	1800
gcagatgttc	gcctgatgaa	tggtggcggt	accatcaaag	ctgactttaa	caccaatggt	1860
tttggcgga	tggttaaagg	cggttacaca	tgaaagacg	gtaatggcct	gtttattcag	1920
ccatatgcca	aactgtctgc	tctgactctg	gaagggtggt	attatcaact	caacggcggtg	1980
gacgttcatt	ctgacagcta	taactctgtg	ctgggtgag	ccggtagcgc	cgtgggttat	2040
gacttcgctg	tgggcaacgc	gaccgttaaa	ccttatctga	atctggccgc	actgaacgaa	2100
ttctctgatg	gcaacaaagt	ccgtctgggt	gatgagtcgt	tcaatgccag	cattgacggt	2160
gcagcattcc	cggtgggtgc	aggtgtacaa	gctgatatca	ccaaaaacat	gggagcatat	2220
gcaagccttg	actacaccaa	aggtgacgac	attgagaacc	cgctacaggg	tgtagttggt	2280
atcaatgtga	cctgg					2295

<210> 153  
 <211> 1980  
 <212> DNA  
 <213> Escherichia coli

<400> 153					
atgtcacgtc	cgcaatttac	ctcgttgctg	ttgagtttgt	tggtcttgcc	60
accttgccaa	cgtttgcttt	tgctactgaa	accatgaccg	ttacggcaac	120
cgtagttcct	tcgaagcgcc	tatgatggtc	agcgttatcg	acacttcgcc	180
caaactgcta	cttcagccac	tgatttgctg	cgctcatgttc	ctggaattac	240
accggacgaa	ccaacgggtc	ggatgtaaat	atgcgtggct	atgatcatcg	300
gttcttctgc	atggtgttcg	ccagggaacg	gataccggac	acctgaatgg	360
gatccggcgc	tgatcaagcg	tggtgagatt	gttcgaggac	cttcagcatt	420
agtgccgcgc	tggtgggagt	gatctcctac	gatacggctg	atgcaaaaga	480
gaaggacaaa	gcagtggttt	tcgtgtcttt	ggtactggcg	gcacggggga	540
ggattaggcg	cgagcgcgtt	tgggcgaact	gaaaatctgg	atggtattgt	600

agtcgcgac	ggggtgattt	acgccagagc	aatggtgaaa	ccgcgccgaa	tgacgagtc	660
attaataaca	tgctggcgaa	agggacctgg	caaattgatt	cagcccagtc	tctgagcgg	720
ttagtgcggt	actacaaca	cgacgcgcgt	gaacaaaaa	atccgcagac	cgttgaagct	780
tctgatagca	gcaaccgcgt	ggctgatcgt	tcaacaattc	aacgcgatgc	gcagctttct	840
tataaactcg	ccccgcagg	taacgactgg	ttaaattgcag	atgcaaaaa	ttactggctg	900
gaagtccgta	ttaatgcgca	aaacacgggg	agttcaggcg	agtatcgtga	acagataaca	960
aaaggagcaa	ggctggagaa	ccgttccact	ctatttgcgc	acagtttcgc	ttctcaacta	1020
ctgacatatg	cgggtgagta	ttatcgtcag	gaacaacatc	cgggtggcgc	gacgacgggc	1080
ttcccgcga	caaaaaatcg	ttttagctct	ggttggtctc	aagatgagat	caccttacgc	1140
gatctgcgca	ttacctgtct	tggcggaacc	cgctatgaca	gttatcgcgc	tagcagcgac	1200
ggctacaaa	atgttgatgc	cgacaaatgg	tcatctcgtg	cggggatgac	tatcaaccgc	1260
accaactggc	tgatgttatt	tggctcatat	gctcaggcat	tccgcgcccc	gacgatgggc	1320
gaaatgtata	acgattctaa	acacttctcg	attggtcgtc	tctatacaca	ctattgggtg	1380
ccaaaccgca	acttacgtcc	ggaactaac	gaaactcagg	agtacgggtt	tgggtgcgct	1440
tttgatgacc	tgatgttgct	caatgatgct	ctggaattta	aagccagcta	ctttgatacc	1500
aaagcgaaag	attatatctc	cacgaccgtc	gatttgcgcg	cggcgacaac	tatgtcgtat	1560
aacgtcccca	acgccaaaat	ctggggctgg	gatgtgatga	cgaatatata	cactgatctg	1620
tttagccttg	atgtggccta	taaccgtacc	cgcggcaaa	acaccgatac	cggggaatat	1680
atctccagca	ttaaccgcga	taccgttacc	agtaccctga	atatcccgat	cgtcacagc	1740
ggcttctctg	ttggttggtg	cggtagcttt	gccgatcgct	caacacatat	cagcagcagc	1800
tacagcaaac	aacctggcta	tggtgtgaat	gatttctacg	tcagttatca	agggcagcag	1860
gcgctcaaa	gcatgaccac	tactctggta	ttgggcaacg	ccttcgataa	agagtactgg	1920
tcgccgcaag	gcattcccaca	ggatggctgt	aacggaaaaa	ttttcgtgag	ttatcaatgg	1980

<210> 154  
 <211> 2157  
 <212> DNA  
 <213> Escherichia coli

<400> 154

atgagggatg	aatgtttata	taatatacct	tgtcgaattt	atatcctttc	cactctgtca	60
ttatgcattt	ctgggatagt	ttctactgca	accgcaactt	cttcagaaac	aaaaatcagc	120

aacgaagaga	cgctcgctgt	gaccacgaat	cgttcggcaa	gcaacctttg	ggaagcccg	180
gcgactatac	aggttattga	ccaacaaaca	ttgcagaact	ccaccaatgc	ctccatagcc	240
gataatttgc	aggacatccc	cggagtagag	ataacagaca	actccttggc	aggccgtaaa	300
caaatccgca	ttcgtggcga	agcatcctcc	cgtgttttaa	ttctcattga	tggtcaggag	360
gtaacttata	agcgcgccgg	agataattat	ggtgtgggac	tgttgataga	tgagtctgcg	420
ctggagcgtg	ttgaggtagt	gaaaggtcca	tattccgtac	tgtacggttc	acaggcaatt	480
ggcggatttg	ttaacttcat	aacaaaaaag	ggaggtgaca	aacttgcatc	tgaggttggt	540
aaagctgttt	ataattccgc	aacagcaggc	tggaagaat	caatcgcggt	ccaggggagc	600
atcggtggtat	ttgattatcg	catcaacggt	agttattctg	atcagggcaa	tcgtgatacg	660
ccggatggag	gtctgccgaa	taccaactat	cgtaacaata	gtcagggtgt	atggttgggt	720
tataactccg	gaaaccatcg	ttttggcctc	tcgcttgatc	gctacagact	cgcgacgcaa	780
acttactatg	aggatccaga	cggaagctat	gaggcattta	gtgtcaaaa	acctaactt	840
gaacgagaga	aagttggggt	attctatgac	acagacgtgg	acggtgacta	tctaaaaaaa	900
attcatttgc	acgcgtatga	gcagaccatc	cagcgccaat	ttgccaacga	agtaaaaacg	960
acacagcctg	ttcccagtc	gatgattcag	gctctgacgg	ttcataacaa	gactgacacc	1020
catgataagc	aatacactca	ggcggtcaca	ttgcagagtc	acttttcgct	gcctgcta	1080
aatgaacttg	ttaccggtgc	acagtacaaa	caagacaggg	tcagccaaag	gtccggtggc	1140
atgacctcaa	gcaaatctct	gaccggcttc	attaataaag	aaacacgaac	tcgctcctat	1200
tatgagtcag	agcaaagtac	agtctcacta	ttcgcacaaa	atgactggcg	attcgccgat	1260
cactggacat	ggacaatggg	agttcgccaa	tactggcttt	cttcaaagtt	gacgcgtggt	1320
gacggagtat	catataccgc	aggcattata	agcgatacct	ctcttgccag	agagtcctgc	1380
agtgatcacg	aaatggtaac	atctacaagc	ctgcgctatt	caggtttcga	taacttggag	1440
ttacgcgctg	cgttcgcgca	aggctacgta	tttccacac	tctccagct	ttttatgcag	1500
acatctcgcg	gcggcagtg	cacatacgga	aatcctgac	ttaaggctga	acactccaat	1560
aactttgaat	taggtgcacg	atataatggt	aatacgtggc	tgattgacag	cgcagtttac	1620
tactcagaag	ctaaagatta	tattgcaagt	ctgatctgtg	atggcagtat	agtttgcaat	1680
ggtaacacca	actcctcccg	tagtagctac	tattattatg	acaatattga	tcgggcacaaa	1740
acatggggac	tggaataaag	cgcggaatat	aatggctggg	ttttctcgcc	atatacagt	1800

ggcaatttaa	ttcgtcgga	atatgaaact	tcaacattaa	aaacaactaa	tacaggagaa	1860
ccagcgataa	acggacgtat	agggctgaaa	catactcttg	tgatgggtca	ggccaacata	1920
atctctgatg	tttttattcg	tgctgcctct	agtgcataag	atgacagtaa	cggtaccgaa	1980
acaaatgttc	cggtctgggc	cactctcaac	tttgagtaa	atacagaatt	cggtaacgag	2040
gatcagtc	ggattaacct	agcactcaat	aacctgacag	acaaacgcta	ccgtacagca	2100
catgaaacta	ttcctgcagc	aggtttta	gcagctatag	gtttgtatg	gaatttc	2157

<210> 155  
 <211> 600  
 <212> DNA  
 <213> Escherichia coli

<400> 155	
atgcgtaaa	60
cctgcattgg	120
aacgctccc	180
gacgcgtgg	240
cactacagcg	300
gcggggccgt	360
tacagccgtg	420
acgcacgatg	480
ggggctggcg	540
tccggtagt	600

<210> 156  
 <211> 1368  
 <212> DNA  
 <213> Escherichia coli

<400> 156	
atgaaaaaat	60
gcaaaaacac	120
aaagcagagg	180
aaaaccgcac	240
aacgcccccc	300



gtagaattta atatggatgc ggaaagtaat catggcctgc tggcaatgac caacgctgat	360
gtgaatagcg atcccactaa tgaatggaat ctcaatggtc gtattctgtt aggttttgat	420
ggtatgcgaa aactggataa tggctatttc gctgggttct ccgcacaacc gctgggggat	480
atgcacggtt cagtaaatat cgaatgatgc gttttcttct ttggcaaaag aaacgactgg	540
aagggtcaag taggccgttt tgaagcctac gatatgttcc cgctgaatca ggataccttt	600
gttgaacatt ccggaataac tgcgaacgat ctttatgacg atggcagcgg ttatatctat	660
atgatgaaag agggccgcgg acgttctaac gctggcggtt atttcctcgt cagcaaaaaa	720
ctcgataact ggtattttga attaaacacg ttactggaag acggaacatc ttatatatac	780
gacggtaatt atcatggacg cgaatggaa cagcagaaaa atgttgctta tctgcgtccg	840
gtaattgcct ggtcgcgcg ggaagaattc accgtttccg cagcgatgga agcgaatgtg	900
gtaataatag cttatgggta taccgatagc aagggttaatt ttgtcgatca gtccgatcgt	960
accggttatg gcatgagtat gacctggaat ggcctgaaaa ccgatccgga aaatggcatc	1020
gtgggttaac ttaataccgc ctatttagat gctaataatg aaaaagattt caccgacggg	1080
attaacgcgc tgtggaacg tttcgagctg ggttatatct atgcacataa taagattgat	1140
gaatttagtg gcgtgggttg tgataacgat tgctggattg atgatgaagg aacatacaac	1200
attcacacca ttcatgcgtc ttatcagttc gctaattgtg tgatatgga gaactttaat	1260
atttacctcg gcacgtatta ctccattctg gatagcgacg gcgataagat acacggcgac	1320
gatagtgatg accgttacgg cgcacgcgtt cgctttaaat acttcttc	1368

<210> 157

<211> 522

<212> DNA

<213> Escherichia coli

<400> 157

atgaacggca aagcgtttct ggcctgcgtt ctgatgagcg tcgtattaac tggctgtgaa	60
acacgcgaaaa aaatcagcca ggtgatccgc aatccggata ttcaggtcgg aaagctgatg	120
gatcagtcga ccgagctgac cgtcacgctg ctgaccgagc cggacacgaa cctgacggcg	180
gatggcgaa g ccgcgccgtt ggtatgccag ttggtttata tgagcgacga ctcaaaattc	240
catgcccgcc actacgacca ggttgccacc accgcgctgc ccgacgtgct ggggaaaaac	300
tatatcgatc accaggactt caacctgttg ccggataccg taaaaacact gccgcgcgatc	360

aagttggatg agaaaaccgg ttatatcggg gtcattgcct atttttcaga cgaccaggcc	420
acagaatgga aacaatttga gtcggtagaa agtatcgcc accactatcg cctgctggtg	480
catatccgcg ccagtgcgat tgagatgaaa aaagaggaaa ac	522

<210> 158  
 <211> 3432  
 <212> DNA  
 <213> *Escherichia coli*

<400> 158	
ctgacgctgg catggatttt tctgctgggtg tggatctggt ggacgggtcc aaaatggacg	60
ctctatgagc agcactgggt ggctccgctg gcaaaccgct ggctggcgac cgccgtctgg	120

ggactttatcg ctctgggtctg gctcacctgg cggtgatga agcgtctgca aaagctggaa	180
aaacagcaga aacagcagcg ggaggaagaa aaagatccgt tgaccctgga actccaccgc	240
cagcagcaat atctggatca ctggctgctg cgctcgcgcc gccatctgga taaccgccgt	300
tatctgtggc agttgccgtg gtatatggtc attggtcctg cggtgacggc caaaagcacg	360
ctgctgcgcg agggctttcc gtctgacatt gtttacacgc cggaagcat ccgggggtgtg	420
gaataaccacc cgctgatcac accgcgagtg ggcaaccagg cggtaatatt cgatgttgac	480
ggcgtactga ccaactcccg cggggatgat ctgctccgcc gccgcctcg cgaacactgg	540
ctgggctggc tgatgcaaac gcgcgctcgc cagccgctca acggtcttat cctgacgctc	600
gatcttcccg atctgtgac ggcgataaaa tccgcgctg agacactggt aaaaatttg	660
cgccagcaac ttcaggagat ccgtcagagc ctgcaactgcc gctcgcctt ttacgtggtg	720
ctgacacggc tggatctgct gaacggcttt gccgcgctgt tccattcact ggataaaaaa	780
gaccgcgatg cgatcctcgg cgtcacattt accgcgcgcg cccatgaaag tgacggctgg	840
cgcagcgaac tgggggcttt ctggcagacg tgggtacaac aggtgaacct ggcgctgtcg	900
gatctggtgc tcgcacaaa cgggtgctgct cccgcgagcg ctgtgttcag cttctcccg	960
cagatgcagg gaacaggaga aatcgtcacc gcaactgctg ccgcatgtct ggacgggtgag	1020
aacatggatg taatgtctgc tggcgtctg ctcacatcct cgctacacgc tggccagggtg	1080
gatgatattt tcacgcagtc gcgcgcccgc cagtacggac tgggtaacag ctgctggca	1140
acctggcctc tgggtggagc gacgccgtat ttactcgc gcctcttccc ggaagtctcg	1200
ctggctgagc cgaacctggc ggggtgaaaac agcgtctggc tgaacagctc ccggcgagc	1260

ctgaccgcct	tttccacctg	tggcgcgga	ctggcgcat	tgatggtcgg	aagctggcac	1320
cattattaca	atcagaactg	gcagtctggc	gttaacgtac	tggcacaagc	taaagccttt	1380
atggacgtac	caccaccgca	gggaacggat	gaattcggca	atctgcaatt	gccattgctt	1440
aaccgcgtac	gcgatgccac	cctggcctat	ggtgattatc	gcgatcacgg	ttttctggcg	1500
gatatgggat	tgtaccaggg	cgcccgcta	ggccgctatg	tggagcaaac	ctacattcag	1560
cttcttgagc	agcgttatct	cccctcgcta	atgaacggcc	tgatccggga	tctaaacatt	1620
gccccgccag	agagcggaag	aaagctcgct	gtgctgcgcg	tagtgcgcat	gatggaagac	1680
aaaagtgggc	gcaacaacga	ggcggtaaaa	cagtacatgg	cacggcgctg	gagcaatgaa	1740
tttcacggcc	agcgcgatat	tcaggcgcaa	ctgatggtgc	atctggacta	tgcgtggag	1800
cacaccgact	ggcacgcgca	gcgcaaaagc	agcgacagcg	atgctgtcag	ccgctggacc	1860
ccctatgata	aaccgatcat	taatgcgcag	caggaactga	gcaagctgcc	catataccag	1920
cgtgtctacc	agacctgcg	caccaaagca	ttaagcgtgt	tgcccgccga	tttgaatttg	1980
cgcgaccagg	ttggtcccac	cttcgacaac	gtgttcgctg	ccggtaatga	tgaaaaactg	2040
gtgatcccg	agttcctcac	ccgctatgga	ctgcaaagct	attttgtcaa	acagcgtgag	2100
ggcctcgttg	agctgaccgc	gctggattcg	tgggtactga	acctgacgca	aagcgtcgcc	2160
tacagcgagg	ccgaccgtga	agagatccag	cgccatatca	ccgaacagta	catcagtgac	2220
tataccgcca	cctggcgctg	cggaatggat	aacctcaacg	tccgtgacta	tgaggccatg	2280
tcggcgctga	ccgacgcgct	ggagcagatt	atcagcggcg	atcagccatt	ccagcgtgcg	2340
ctgacggcgc	tgcgcgataa	tacccacgcg	ctgacgctct	ccggcaaaact	ggatgataag	2400
gcgaggggaag	cggcgataaa	tgagatggat	taccgcctgt	tatcccggtc	ggggcatgag	2460
ttcgcacccg	aaaacagcgc	actggaggag	caaaaggaca	aggcgagtag	gctacaggcc	2520
gtgtaccagc	aactgaccga	gctgcaccgt	tacctgctgg	cgatccagaa	ctgcgccatg	2580
ccggggaaat	cggcgctgaa	agcagtacag	ctacggctgg	atcaaaacag	cagcgatcca	2640
atcttcgcca	cccgtcagat	ggcaaaaacc	ctgcctgcgc	ctcttaaacg	ctgggtaggt	2700
aagctcgcgg	atcaggcctg	gcattgtgtg	atggtggaag	ccgttcgcta	catggaagtg	2760
gactggcgcg	acaatgtagt	gaaacccttc	aacgagcagc	ttgccgataa	ctatccgttt	2820
aatccgcgcg	ccacacagga	tgctctactg	gattcgtttg	aacgtttctt	taaaccggat	2880
ggcattcttg	acaatttcta	caagaacaac	ctgcgcctgt	tccttgaaaa	cgatctgacc	2940

tttggcgacg acggcagagt gttaatccgt gaagatatcc ggcagcaact ggataccgcg 3000  
 cagaaaatcc gcgacatctt cttcagccag cagaacgggc tgggcgcaca gtttgccgtg 3060  
 gaaaccgtat cgctttccgg caataagcgg cgcagcgtac ttaacctgga cgccagttta 3120  
 gtggactaca gccaggggacg caactacacc gcccatctgg tctggccgaa caacatgcgt 3180  
 gaaggcaatg aaagcaagct gacgctgatt ggcaccagcg gcagagcacc gcgcagtatc 3240  
 gcgttcagtg gaccgtgggc gcagttccgc ctgttcggcg cgggccagtt gaccaatgtg 3300  
 accagtgaca cctttaacgt gcgctttaac gtggacggcg gcgcaatggt ttaccagggt 3360  
 catgtggata ccgaagataa cccgttcacc ggcggtctgt tcagcctggt ccgtttaccg 3420  
 gatacgttgt at 3432

<210> 159  
 <211> 725  
 <212> PRT  
 <213> *Escherichia coli*

<400> 159

Met Arg Ile Asn Lys Ile Leu Trp Ser Leu Thr Val Leu Leu Val Gly  
 1 5 10 15

Leu Asn Ser Gln Val Ser Val Ala Lys Tyr Ser Asp Asp Asp Asn Asp  
 20 25 30

Glu Thr Leu Val Val Glu Ala Thr Ala Glu Gln Val Leu Lys Gln Gln  
 35 40 45

Pro Gly Val Ser Val Ile Thr Ser Glu Asp Ile Lys Lys Thr Pro Pro  
 50 55 60

Val Asn Asp Leu Ser Asp Ile Ile Arg Lys Met Pro Gly Val Asn Leu  
 65 70 75 80

Thr Gly Asn Ser Ala Ser Gly Thr Arg Gly Asn Asn Arg Gln Ile Asp  
 85 90 95

Ile Arg Gly Met Gly Pro Glu Asn Thr Leu Ile Leu Ile Asp Gly Val  
 100 105 110

Pro Val Thr Ser Arg Asn Ser Val Arg Tyr Ser Trp Arg Gly Glu Arg  
 115 120 125

Asp Thr Arg Gly Asp Thr Asn Trp Val Pro Pro Glu Gln Val Glu Arg  
130 135 140

Ile Glu Val Ile Arg Gly Pro Ala Ala Ala Arg Tyr Gly Ser Gly Ala  
145 150 155 160

Ala Gly Gly Val Val Asn Ile Ile Thr Lys Arg Pro Thr Asn Asp Trp  
165 170 175

His Gly Ser Leu Ser Leu Tyr Thr Asn Gln Pro Glu Ser Ser Glu Glu  
180 185 190

Gly Ala Thr Arg Arg Ala Asn Phe Ser Leu Ser Gly Pro Leu Ala Gly  
195 200 205

Asp Ala Leu Thr Thr Arg Leu Tyr Gly Asn Leu Asn Lys Thr Asp Ala  
210 215 220

Asp Ser Trp Asp Ile Asn Ser Pro Val Gly Thr Lys Asn Ala Ala Gly  
225 230 235 240

His Glu Gly Val Arg Asn Lys Asp Ile Asn Gly Val Val Ser Trp Lys  
245 250 255

Leu Asn Pro Gln Gln Ile Leu Asp Phe Glu Val Gly Tyr Ser Arg Gln  
260 265 270

Gly Asn Ile Tyr Ala Gly Asp Thr Gln Asn Ser Ser Ser Ser Ala Val  
275 280 285

Thr Glu Ser Leu Ala Lys Ser Gly Lys Glu Thr Asn Arg Leu Tyr Arg  
290 295 300

Gln Asn Tyr Gly Ile Thr His Asn Gly Ile Trp Asp Trp Gly Gln Ser  
305 310 315 320

Arg Phe Gly Val Tyr Tyr Glu Lys Thr Asn Asn Thr Arg Met Asn Glu  
325 330 335

Gly Leu Ser Gly Gly Gly Glu Gly Arg Ile Leu Ala Gly Glu Lys Phe  
340 345 350

Thr Thr Asn Arg Leu Ser Ser Trp Arg Thr Ser Gly Glu Leu Asn Ile  
355 360 365

Pro Leu Asn Val Met Val Asp Gln Thr Leu Thr Val Gly Ala Glu Trp  
370 375 380

Asn Arg Asp Lys Leu Asp Asp Pro Ser Ser Thr Ser Leu Thr Val Asn  
385 390 395 400

Asp Arg Asp Ile Ser Gly Ile Ser Gly Ser Ala Ala Asp Arg Ser Ser  
405 410 415

Lys Asn His Ser Gln Ile Ser Ala Leu Tyr Ile Glu Asp Asn Ile Glu  
420 425 430

Pro Val Pro Gly Thr Asn Ile Ile Pro Gly Leu Arg Phe Asp Tyr Leu  
435 440 445

Ser Asp Ser Gly Gly Asn Phe Ser Pro Ser Leu Asn Leu Ser Gln Glu  
450 455 460

Leu Gly Asp Tyr Phe Lys Val Lys Ala Gly Val Ala Arg Thr Phe Lys  
465 470 475 480

Ala Pro Asn Leu Tyr Gln Ser Ser Glu Gly Tyr Leu Leu Tyr Ser Lys  
485 490 495

Gly Asn Gly Cys Pro Lys Asp Ile Thr Ser Gly Gly Cys Tyr Leu Ile  
500 505 510

Gly Asn Lys Asp Leu Asp Pro Glu Ile Ser Val Asn Lys Glu Ile Gly  
515 520 525

Leu Glu Phe Thr Trp Glu Asp Tyr His Ala Ser Val Thr Tyr Phe Arg  
530 535 540

Asn Asp Tyr Gln Asn Lys Ile Val Ala Gly Asp Asn Val Ile Gly Gln  
545 550 555 560

Thr Ala Ser Gly Ala Tyr Ile Leu Lys Trp Gln Asn Gly Gly Lys Ala  
565 570 575

Leu Val Asp Gly Ile Glu Ala Ser Met Ser Phe Pro Leu Val Lys Glu  
580 585 590

Arg Leu Asn Trp Asn Thr Asn Ala Thr Trp Met Ile Thr Ser Glu Gln  
595 600 605

Lys Asp Thr Gly Asn Pro Leu Ser Val Ile Pro Lys Tyr Thr Ile Asn  
610 615 620

Asn Ser Leu Asn Trp Thr Ile Thr Gln Ala Phe Ser Ala Ser Phe Asn  
625 630 635 640

Trp Thr Leu Tyr Gly Arg Gln Lys Pro Arg Thr His Ala Glu Thr Arg  
645 650 655

Ser Glu Asp Thr Gly Gly Leu Ser Gly Lys Glu Leu Gly Ala Tyr Ser  
660 665 670

Leu Val Gly Thr Asn Phe Asn Tyr Asp Ile Asn Lys Asn Leu Arg Leu  
675 680 685

Asn Val Gly Val Ser Asn Ile Leu Asn Lys Gln Ile Phe Arg Ser Ser  
690 695 700

Glu Gly Ala Asn Thr Tyr Asn Glu Pro Gly Arg Ala Tyr Tyr Ala Gly  
705 710 715 720

Val Thr Ala Ser Phe  
725

<210> 160  
<211> 2175  
<212> DNA  
<213> Escherichia coli

<400> 160

atgagaatta acaaaatcct ctggtcgcta actgtgctcc tagttgggtt gaatagccag	60
gtatcagtag ccaaatactc cgacgatgat aatgacgaga ctctgggtgtt ggaagccacc	120
gctgagcagg tattaaaaca gcagccgggc gtgtcgggta ttaccacgga ggatattaaa	180
aagaccctc cggtaaacga cctttcagat attattcgta aaatgcctgt tgttaatcctt	240
accggcaata gcgcctcggg cacacgggt aataaccgcc agatcgatat tcgtggtatg	300

gggccggaaa	acaccttaat	tttaattgat	ggtgtaccgg	tgacgtcacg	taactccgtg	360
cgttatagct	ggcgtgggga	gcgtgatacc	cgcggtgaca	ccaactgggt	gccaccggaa	420
caggttgagc	gtattgaagt	gatccgcggc	cctgcggcgg	cgcgctacgg	ttcggggggc	480
gccggggggg	tggtgaacat	cattacccaa	cgtcccacca	acgactggca	cggttcgctg	540
tcgttataca	ccaaccagcc	ggaaagtagc	gaagaggggc	ctacgcgtcg	cgccaatttc	600
agccttagtg	ggcctctggo	tggtgatgct	cttaccacgc	gtttgtatgg	taacctgaat	660
aaaacggatg	ctgacagttg	ggatattaat	tctccggctg	gtacgaaaaa	cgcagccggg	720
catgaagggg	tacgtaacaa	agatattaac	ggcgttgtct	cgtggaaatt	aaatccgcag	780
cagattctcg	atttcgaagt	cggatatagc	cgccagggga	atatctatgc	gggcgatacg	840
cagaacagtt	cttcagatgc	agttaccgaa	agcctggcaa	aatccggcaa	agagacgaac	900
cgctgttacc	gacagaatta	tggcattacg	cataatggta	tctgggactg	gggacaaaagt	960
cgctttggtg	tttattacga	gaaaaccaat	aatacccgca	tgaatgaagg	attatccggc	1020
ggtggtgaag	gacgtatctt	agcgggtgaa	aagtttacga	ccaatcgctc	gagttcctgg	1080
cgaaccagcg	gtgagcttaa	tattcctttg	aatgtgatgg	ttgatcaaac	gctgaccggt	1140
ggtgcagagt	ggaaccgcga	taagctcgat	gatccttcct	ctaccagcct	gacggtgaat	1200
gacagagata	tcagcggtat	ttctggctct	gctgcggatc	gcagcagtaa	aaatcattct	1260
caaatcagtg	cgctgtatat	tgaagataac	attgagccgg	ttcctggcac	gaatatcatt	1320
cccggcctgc	gctttgatta	tctcagcgac	tccggcgggg	acttcagccc	cagtctgaat	1380
ctttcgcagg	aattgggcga	ttatttcaaa	gtcaaagcag	gggttccccc	aacctttaa	1440
gccccaaacc	tgtatcaatc	cagtgaaggc	tatctgctct	actcgaaaag	caatggctgt	1500
ccaaaagata	ttacatcagg	cgggtgctac	ctgatcggtg	ataaagatct	cgatccggaa	1560
atcagcgtca	ataaagaaat	tggactggag	ttcacctggg	aagattacca	cgcaagtgtg	1620
acctacttcc	gcaatgatta	ccagaataag	atcgtggccg	gggataacgt	tatcgggcaa	1680
accgcttcag	gcgcataatat	cctcaagtgg	cagaatggcg	ggaaagctct	ggtggacggg	1740
atcgaagcca	gtatgtcttt	cccactgggt	aaagagcgct	tgaactggaa	taccaatgcc	1800
acatggatga	tcacttcgga	gcaaaaagac	accggtaatc	ctctgtcggt	catcccggaa	1860
tatactatca	ataactcgct	taactggacc	atcaccagcg	cgttttctgc	cagcttcaac	1920
tggacgttat	atggcagaca	aaaaccgcgt	actcatgcgg	aaaccgcgag	tgaagatact	1980
ggcggctctgt	caggtaaaga	gctgggcgct	tattcactgg	tggggacgaa	cttcaattac	2040



```
gatattaata aaaatctgcg tcttaatgtc ggcgtcagta atatcctcaa taaacagatc 2100
ttccgatctt ctgaaggggc gaatacctat aacgagccag gccgggctta ttatgccgga 2160

gttaccgcat cattc 2175
```